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ABSTRACT

This document presents articles concerned with curriculum, graduate and professional education, and finance. Articles discuss the changing college curriculum; the academy and general education; Pennsylvania's "state-owned" institutions, some dimensions of degree output; the quality of graduate studies in Pennsylvania and other selected states; exceptional graduate admissions at the Pennsylvania State University; and the rationale for various plans for funding American higher education. (MJM)

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Insights into Higher Education: Selected Writings of CSHE, 1969-73

Volume III: Curriculum, Graduate and Professional Education, Finance

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Contents

Page

Foreword v

Introduction vii

The Changing College Curriculum 1

The Academy and General Education *Stanley Ikenberry* 11

Pennsylvania's "State-Owned" Institutions: Some Dimensions of Degree Output *William Toombs and Stephen D. Millman* 28

The Quality of Graduate Studies: Pennsylvania and Selected States *William Toombs and Stephen D. Millman* 85

Exceptional Graduate Admissions at the Pennsylvania State University *Manuel G. Gunne and Larry L. Leslie* 116

The Rationale for Various Plans for Funding American Higher Education *Larry L. Leslie* 158

Foreword: The Dilemma of Understanding

In their examination of academic institutes and centers, Ikenberry and Friedman refer to those worlds beyond the academic department as the organizational entity best able to "coordinate the talents of several professionals in accomplishing a single task or goal."

From its founding in 1969, the Center for the Study of Higher Education at The Pennsylvania State University has had one main task or goal—increased understanding of higher education. Its director has said: "Colleges and universities . . . have never been well understood by those who support them, i.e., the larger society. Indeed they are not always well understood by their own constituencies—students, administrators, faculty, or alumni. If they had been understood, they might not be under attack."

If this is truly the state of the art, if, as has been suggested, higher education is suffering from crises of confidence (Dressel), breakdowns in belief and loyalty (Clark), and is headed toward becoming, in Kerr's terms, a quasi-public utility, then any attempt to increase understanding of these changes seems a proper concern of the Center. If pressures on higher education are increasingly external, perhaps the answers can be suggested from inside the academy itself. To this end the Center has studied higher education and disseminated its findings in a continuing series of publications—reports, conference papers, and monographs—over its four-year life. A compilation such as this attempts to cull some of the thinking of Center staff on a variety of issues as well as purview one Center's areas of study.

Center personnel and professionals who have contributed papers to Center publications and conferences in the last four years have addressed themselves to several areas where the university has been attacked and is undergoing major shifts. This monograph collects some of their thinking on several recurring issues—curriculum, graduate and professional education, and finance.

The original place and date of publication are indicated at the bottom of the first page of each paper. The papers appear in their original form except for minor editorial changes.

INTRODUCTION

The broad area of graduate and professional education with the concomitant areas triggered by such a concern—undergraduate curricula changes, general education, and funding, has been a third area of concern for Center personnel.

G. Lester Anderson and Stanley Ikenberry ask some initiating and pertinent general questions about the college curriculum as an introduction to this group of papers. Anderson suggests a particularly important concern in this period of post-student-riot "calm." The students, he feels, "are asking for education which interprets and is critical of our philosophical bases for human relationships. Such education would appear to be existential in its own philosophical base. It is basically not pragmatic. It is most often anti-puritan. It is often anti-naturalistic." These challenges cannot, he states, be ignored.

He delimits the current discipline-based institutions and suggests distinctions for vocationally oriented institutions *vis à vis* higher educational institutions. Most crucial here, as he says, is the establishment of identity and integrity between any institution and its constituents.

Ikenberry continues Anderson's discussion of the pressures on colleges to change curricula and looks at what this means for the traditionally defined "generally educated." He suggests three periods in this century's evolving higher education curricula from the "liberally educated gentleman" to, as Anderson also implied, the student who is asking new and more personal things of the college. He suggests several alternatives and concludes that new organizational alternatives must be devised in the general education programs of the future.

William Toombs, the present associate director of the Center, and Stephen Millman's two papers form a neat progression looking first to some dimensions of degree output in Pennsylvania then looking at the larger picture of graduate studies in Pennsylvania and several other states. The first paper, a historical review of the state-owned institution in Pennsylvania, could probably serve as a typical model for the development of the normal schools of many states. An especially significant year for these institutions was 1966, when recipients of doctorates who had graduated from state-owned institutions topped the number of doctoral recipients from ten representative private colleges.

Toombs and Millman conclude that a new role for the state-owned institutions has been forming for a dozen years but that the institutions have been restrained from fulfilling this role. "Such a policy of containment, if pursued literally," they warn, "will inevitably result in larger numbers of unemployable college grads." They continue, "Teacher demand is limited: general education has become, since 1969, insufficient. And the specialized programs now operating cannot achieve full value without careful cultivation."

Moving from undergraduate institutional output, these same writers turn to a descriptive study of the quality of graduate studies in Pennsylvania. Again the Commonwealth is castigated for "dragging its feet" in graduate education. They conclude: In the light of the data . . . the emphasis on more high quality graduate programs is no mere cry for expansion. It is the simple recognition of the need for an investment that has been too long postponed."

The final two papers in this section seem to bring the three sections full circle, from the complex processes involved in successful academic governance to the equally complex processes of finance. The Gunne and Leslie study of graduate admissions at Penn State is the only in-house reporting included in this edition, although the Center, of course, has sponsored other investigations of this type. It is included because it is generalizable to graduate admissions problems on a larger scale than Penn State and because thematically, at least, it does follow somewhat the thinking of Toombs and Millman. If the quality and quantity of graduate programs must be improved then, according to Gunne and Leslie, exceptional admissions should be part of this improvement. They conclude that in regard to faculty perception, exceptionally admitted graduate students do not differ importantly from traditional students, and the policy should be equal consideration for all.

Ikenberry suggests that the current closed market in general education—single source suppliers—must also be broken with the introduction of a wider range of competitive and attractive alternatives. In Volume I, Leslie discussed the market model as a model for funding higher education. In the paper which closes this section, he discusses this and other rationales for various funding plans. It is yet another look at the problem of college access and programming suggested in the preceding papers. This address brings this section and the edition of some of the Center publications to a close on a pragmatic note.

Governance, accountability, postsecondary education, graduate and professional education, and the changes that affect them stem from causes which are economic, societal, personal, and educational; not the least among these is funding. Without fully considering the "how" of higher education in dollars and cents there may be no need to debate the "what."

THE CHANGING CURRICULUM*

G. Lester Anderson

Clear and consistent trends concerning the curriculum of American colleges and universities are at this time hard to discern. Mayhew declares that "no clear resolution of basic issues has yet been accomplished." He goes on to observe that "further resolution is not likely for issues seem rooted in man's condition, in the change and flux of life, and in society."[1]

But to approve these observations is not to deny that issues exist on which a given institution may be expected to take a position, or that there is currently within institutions of higher education much ferment regarding goals and purposes and means to attain them. Indeed, ferment at the present time is considerable. Institutions of any size and of any character should be aware of this ferment, its potential for change, and should have a stance or posture, albeit a flexible one, about themselves and their future.

One development that obliges us to sharpen our perspectives about the curriculum is the manifestation of student concern and student aggression. The message which should be coming through from students is not recognized as a message, or, if it is recognized, is then misread.

The aggression displayed by students on a number of American campuses these last years has failed of its purpose. The clamor of the aggressors, the frontal attack upon long-established value systems, the crudity, bad taste, and, sometimes, violence, have concealed the message. But the message is there for those who would hear it. It is a message that curricula must be reformed and instruction improved. It carries, of course, a deeper meaning, an extreme distress for value systems pervasive in our culture which permit of racism, war, poverty, indulgence, and an almost callous unconcern for the condition of other human beings. Who would claim that these deep concerns do not have profound implications for the college curriculum?

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*Originally published in the *Journal of General Education* 23 (No. 1).

[1] Lewis B. Mayhew, *The Collegiate Curriculums—An Approach to Analysis*, SREB Research Monograph Number 11 (Atlanta: Southern Regional Education Board), pp. 10-11.

What I think is happening is this: A significant proportion of our students, significant enough to have disturbed not only the community internal to the college but to have startled, disturbed, and shocked almost all organized segments of our social system, are saying that traditional higher education, including the curriculum, is now largely irrelevant, at least irrelevant for goals which should be ours.

These young people are bright. They are well informed for their years. They come from homes of affluence and of pervasive middle-class value systems as well as from the so-called underprivileged segments of society. They are saying that relevant higher education should produce a changing value system for America and should do so immediately. They are impatient with the slow pace traditional in any curriculum change. Education, they say, should not be the handmaiden for, or in service to, the wealth-producing community as such, the defense community as such, the "secure" segments of the population as such. They are asking for education which interprets and is critical of our philosophical bases for human relationships. Such education would appear to be existential in its own philosophical base. It is basically not pragmatic. It is most often anti-puritan. It is often antinaturalistic. I do not, however, wish to pretend that I sufficiently understand what is being said to know in any definitive way what an institution should do. Although I share the concern of many adults that in the name of antiaggression and antiviolence some students act with aggression and violence, and that protests for freedom often become exercises in license, I know that the majority of protesting youth are protesting from a strongly moral base. Their warnings, their challenges, their disturbances cannot be ignored.

Having pronounced this homily I return to curricular considerations. A simplistic resolution of basic issues is not to be expected; a monolithic integrity of purposes and process for all American colleges cannot, and in my view should not, be attained. But there is a common base from which to work. All American college curriculums are in the end based upon knowledge, and knowledge in our culture is based upon discipline. Subjects will not disappear. We are heirs to an organization of knowledge derived from Aristotle and signified by the disciplines in which the Western tradition and culture reside and through which Western culture advances. We do not conceive a significant departure from a knowledge-based, discipline-controlled, subject-centered curriculum for America's colleges. This applies to vocational, technical, experience-emphasizing institutions as well as to those with a strong liberal-general-education emphasis, conservative or classical in educational orientations.

But given this base, there is great latitude in which each institution can express its own integrity, its own educational style, its own emphasis, its own value systems—can have its *geist.* And the heart of the matter is for each college to know this and to attain or assert its own identity.

The alternatives available to an institution in charting its course are several. If an institution wishes to give more than lip service to liberal or general-education objectives it will of necessity operate from a philosophical base. Taylor has identified three philosophical systems which are represented in American institutions. He calls these systems rationalism, neo-humanism or eclecticism, and naturalism.[2] While none is extant in pure form, rationalism is represented in most Catholic colleges and at St. John's, neo-humanism has characterized general education programs at, for example, Harvard and Columbia, and naturalism is basic at Antioch, Sarah Lawrence, and the old General College at Minnesota.

Some colleges exist, apparently, as feeder schools to the graduate and professional schools of the university, and their emphasis is almost entirely disciplinary. They may enforce distributional requirements to give plausibility to their ostensible support of general or liberal educational values, but majors in the disciplines are the crux of their programs. Each discipline knows its primary task is to "train" a man or woman who can perform adequately within the framework of a discipline in a university graduate department or in a professional school. The philosophical base, if there be one, is pragmatic or utilitarian. This is to say that the disciplines are highly useful, and people who understand them are useful people either as disciplinarians themselves or in professions which have a disciplinary base. And colleges, or some colleges at least, exist to educate and train such people.

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[2] Harold Taylor, "The Philosophical Foundations of General Education," Chapter II of *General Education,* Fifty-First Yearbook, Part I, National Society for the Study of Education (University of Chicago Press, 1952), pp. 20-45.

It is interesting to consider Daniel Bell's deservedly prize-winning volume, *Reforming of General Education,*[3] in these terms. The book reveals a brilliant intellect and a master of a discipline at work. But Bell's book is in the final analysis a restatement of the value of the individual who has confronted and has attained relative control of his discipline. Then and only then is one to "go beyond" and involve himself, for example, in interdisciplinary study.

I should state that I find nothing objectionable in American colleges which accept a discipline orientation, per se. I have great respect for the disciplines and for persons who are competent in them. But I would want such institutions to know what they are and not pretend to be otherwise. All the connotations of a discipline-orientation should be recognized. For example, to practice within a discipline, that is, to have a chemistry major and work as a bench chemist or to take a major, especially a doctorate, in history and teach it, is to have been vocationally educated. A discipline-oriented institution should not be "holier than thou" regarding professionally or technically oriented institutions.

Many American colleges have highly significant "vocational-objective roles" to play in American life. Teaching is the most important vocational outlet for graduates of most four-year colleges, but many such colleges also offer programs in vocational areas such as business, nursing, and science-related technologies, for example, computer services, which are most important to the nation. I believe it is as legitimate and as socially significant for colleges to educate teachers or accountants as for them to send graduates to the Harvard Business School, to the Yale Law School, or to the Graduate Economics Department of Michigan State University. But again, let each college know what it is, and know what it is doing. Let it not confuse its identity, deny its personality, or pretend to purposes which it does not attain. I believe also that this is the essence of the "academic honesty" the students are demanding.

An institution, then, must make choices or determine emphases among liberal and vocational ends. It must find in some fashion philosophical roots or accept a pragmatic solution to the need for a philosophical base by accepting, interalia, a pragmatic philosophy.

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[3] Daniel Bell, *The Reforming of General Education: The Columbia College Experience in Its National Setting* (New York: Columbia University Press, 1966). Also Anchor edition, 1968.

Within the liberal-general education context, and with a common philosophical base, institutional styles and attendant development of human personalities can vary. Is to liberally educate a man to make him a thinking man? a moral man? a happy man? a wise man? an adjusted man? a conforming man? a learned man? a free man? a creative man? a developing man? Perhaps the objective visualizes a total man who will be reflective, wise, and moral. It is, in my opinion, of some significance for faculty, for administrators, indeed, for students to think about such things. For college faculties such concerns and their review are as significant, if not more so, than the numbers of credits to be granted for ROTC, the number of courses to be required outside the major, or the validity of a "C" average requirement for graduation. Indeed, an institution that gives thought to the former concerns is typically not so much worried about the latter. Inversely, an institution which seems not concerned about the integrated substance of its curriculum is too often unduly concerned about form.

What I have tried to say without any particular clarification of categories of choice, is that, while there will be no "national higher education establishment," no resolution of issues which will make all institutions basically alike, each institution should have a reasonable perspective on itself and know what it is. And it should also know what it can become.

I do believe, however, there are a few values on which we can take a common stand. That is, while we may represent diversity of values philosophically and in purpose, we can unite on others.

Higher education should be strongly intellectual in content and method. Courses or programs should always test the intellectual mettle of students enrolled in them. A test often applied to determine whether a program is of collegiate and not simply postsecondary quality is the degree to which it makes intellectual demands on its students. It is true that institutions differ greatly in their intellectual selectivity, using such measurements as the College Board Scholastic Aptitude Tests. In addition, institutions will differ greatly one from another in their relative emphasis on an intellectual component as contrasted with, for example, a performance component in the attainment of basic purposes. But no institution can eliminate a commitment to the intellectual development of its student body except as it ceases to be an institution of higher learning.

To fail to develop the intellectual capacities of students in a really significant way is to fail to educate. While distinctions between education and training are often based on snobbery and are also often invidious, there is a point to the distinction. Any institution which only trains to a performance standard and ignores the intellectual base to performance is not worthy of the collegiate designation.

Higher education should influence value commitments. The value systems of students should normally have a rather powerful affective base as well as an intellectual base. The value system developed should, it would seem reasonable to conclude, pertain to one's personal system of values and to the discipline or profession which is the larger component of a given student's formal collegiate education. What Sanford is saying in his book, *Where Colleges Fail,*[4] is that they fail to help their students establish a value system. Certainly the liberally educated man is a man apart in that he has *commitments* to certain processes of thought and behavior. We know that students undergo a process which the sociologists call "socialization" as they master a discipline or are trained to a profession. Socialization implies a commitment on the part of the professor to lead his students beyond knowledge and intellect to those aspects of being and doing which comprise the affective domain. We know that education is not based merely on exposure to knowledge or even on lessons learned and credits collected. One who "goes to college" experiences a way of life which is unique in that it combines the intellectual and the affective to produce the truly educated person. This must be true for persons who attend liberal arts colleges, teachers colleges, business colleges, engineering colleges, schools of fine arts, of medicine, or of law.

Third, it seems to me that education should be conducted with style. By this, I mean, the curriculum and processes of instruction should not be bland, tasteless, or mechanical. Education should, for a given institution, possess individuality, character, distinctiveness, and distinction. It should not only inculcate value but should itself be value laden. Those who dispense it should care and should be perceived by students as caring. The ends to be attained and the means used should be important to the students involved. Not only should an institution have an identity and integrity, that it has both should also be clear to students as well as staff. Identity and integrity are the essence of style, and they command a loyalty not because it is due but because it is unnatural to withhold it. Such characteristics always mark the great institutions, but they can also mark the nationally unhonored and unsung, and so they should.

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[4] Nevitt Sanford, *Where Colleges Fail* (San Francisco: Jossey-Bass, 1967).

I have no particular attachment to some of the currently faddish modes of curriculum organizations. I think a junior year abroad would be very nice, but is not *ipso facto* superior to a year in the United States. I am relatively indifferent as to whether a student pursues four subjects carrying four credits each per term or five subjects carrying three credits. Distinction between semester, trimester, quarter systems and what have you seem to me to be relatively insignificant except in one regard. Institutions which are seemingly innovative or creative (horrid words) about such matters are frequently institutions which have style. In different terms, these activities indicate that an institution "cares." I earlier cautioned that institutions which are concerned with form are sometimes not concerned with substance, particularly when an institution is seemingly following trends rather than leading them. But departures from the norms in calendar, schedule, credit arrangements, class processes and so on, often affect learning. They affect it not because of intrinsic merit or causal relationship, but because they signify a lively institution, a caring institution, and students respond with higher than normal motivation and expectation in such situations.

To summarize this section we may say the following: While a variety of curricular issues remain moot, certain values regarding any institution's program should be common. At all times the curriculum should have significant intellectual components and should assure that students are tested intellectually. At all times, values and values with an affective base should be being established. Finally, an institution can and should care; it can and should achieve an institutional style that belongs to it and which attracts, if not commands, commitment to the institution.

Let us now make a few suggestions regarding the role of presidents and deans in attaining these objectives for a given college.

it is easy to say that a college should do this or do that. How ends are to be attained is more difficult to prescribe than to specify the ends themselves. But let us suggest some means to ends.

Presidents and deans and, I should add, trustees have a significant role. Ruml's famous dictum: "The trustees have lost control of the faculty and the faculty have lost control of the curriculum" has some validity. But it is doubtful that trustees should have control of the faculty, as might seem to be implied. And faculty have not altogether lost control of the curriculum, even though it sometimes seems to be so. Frequently, what faculty members are doing, as the curriculum seems to proliferate without reason, is "their thing." When leadership of a truly leading or motivating character is provided, things become orderly, valid, and right. By leadership we do not mean assertion of authority. Nor by leadership do we imply the exercise of managerial skills. The essence of leadership is the infusion of value.[5] It is the infusion of value that is called for from presidents or deans or both.

Sometimes all that is needed is to reassert values once established but currently ignored. Through percept, example, and judicious use of approval, administrators can signify or reaffirm what is important, and these acts will be enough. The faculty must ultimately give its sanction to values asserted and must make any curriculum operative if it is to be viable. But faculties oftentimes, I believe much more often than not, want to give sanction to worthy values and viable programs. If managerial tasks preoccupy those presumably in charge, then educational values are bound to fade from perception and lose their controlling quality.

If trivial values preoccupy the attention of the nominal leaders, then trivial values will prevail. Sometimes means supplant the ends in the value system, and thus pervert the values. Signs replace that which they should signify. What does the President attend to day in and day out? What does the Dean attend to? Who get appointments most readily: those with educational concerns or those with managerial concerns? Where are resources allocated? Are funds available for faculty travel to review programs elsewhere as well as for administrators to review affairs of state? Are books about higher education as available to faculty members as books on management techniques are to business administrators?

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[5] Philip Selznick, *Leadership in Administration* (Evanston: Row-Peterson, 1958).

What is put on the agenda for faculty meetings by presidents or deans? Do issues of curriculum loom as large as processes for registration of students? What topics do trustees expect to discuss at their meetings? Do faculty members or their representatives ever review for members of boards of trustees matters of program development or evaluation?

Presidents and deans affirm the value systems they deem important not so much in their semiannual addresses to the faculty (and such addresses can be important) as in their handling of daily affairs of college life, in how they budget their time, in whom they are seen with, in what they talk about as they lunch with faculty members. In all these seemingly mundane activities they are exercising leadership. Does their behavior represent concern for curriculum, for particular institutional purposes, for particular processes of education, for particular faculty and student welfare, or does their behavior seem to indicate these matters are really irrelevant?

John Brubacher in his *Bases for Policy in Higher Education*[6] notes that both Harold Dodds, once president of Princeton, and Harold Stokes, president of several worthy colleges and universities, in their books on the college and university presidency assert the essentiality of the president having formed a "mature and consistent" philosophy of education. Proper exercise of the presidency—and the same can be said for the deanship, and in different form for the trustee—requires the formation of an educational value system as well as the cultivation of managerial skills. While it is a partial truth to say that the curriculum belongs to the faculty, the president, as he carries in his person and in his deeds the value system of an institution, influences the faculty in what they do about the curriculum.

Curriculum renewal or curriculum reform, as well as curriculum maintenance, occurs successfully only when administration for dealing with curricula is properly organized by the college. If administrative acts do not provide sufficient time for faculty service in curriculum matters, if procedures for production of policy statements are nonexistent or weak, if processes for implementation of policy decisions are haphazard or confused, if curriculum policy implementation is unduly delayed, one cannot expect the faculty to maintain a responsible concern. Responsibility for adequate administration for change as well as for order is a responsibility of deans and presidents.

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[6] John S. Brubacher, *Bases for Policy in Higher Education* (New York: McGraw-Hill, 1965), p. ix.

Nowhere have I said there should be committees either standing or ad hoc. It is interesting to note that Daniel Bell, as he worked at Columbia, was considered to be a committee of one! Nowhere have I said there must be a curriculum coordinator. Nowhere have I said there must be an outside grant to support review or reform. What I have tried to say is that leadership must be exercised and that leadership is essentially a matter of getting commitment to values. And I have added that processes for orderly implementation of change or reform must be present and adequately administered. There are no magic formulas, royal roads, or any Aladdin's lamp, that I know of, to secure quality or achieve change—only commitment, imagination, and hard work.

THE ACADEMY AND GENERAL EDUCATION*

Stanley O. Ikenberry

There is a growing self-consciousness in American colleges and universities as serious attempts are made to understand and to cope with the expanding pressures for change. One of the prime targets for change has been the college curriculum, and the bull's-eye on that target is general education. More than other elements in the college curriculum, general education's role has been to aid in the transfer of culture from generation to generation; this task has become more difficult, however, as the definition of "culture" has become more elusive. In a period of unparalleled cultural change, general education must also change. The questions of what to change, and how to change, and for what reasons remain largely unasked and, therefore, unanswered.

Interestingly, general education may be defined in essentially the same terms as were used over twenty-five years ago in a study by the American Council on Education: "General education refers to those phases of nonspecialized and non-vocational education that should be the common denominator, so to speak, of educated persons as individuals and as citizens in a free society."[1] Because of its central and obvious place in the curriculum, general education has received more than its share of attention over the years. Typically, students concentrate on general education courses during most of their first two years in college, although some have argued convincingly that general education should [illegible] the concluding experience of the college career—not the initial one.[illegible] General education programs may be operated by a separately organized administrative unit such as a "general" or "basic" college, or courses may be under the control of the conventional academic departments. The program may include specially designed courses such as integrative seminars or survey courses or may be drawn from the standard inventory of introductory offerings of the department. General education courses have been more likely than others to profess a concern for student attitudes and values and for "appreciation" as well as for knowledge, skills, and abilities.

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*Originally CSHE Report No. 7, December 1970.

[1] American Council on Education, *A Design for General Education: for Members of The Armed Forces* (Washington, D.C.: American Council on Education, 1944).

[2] Theodore R. Vallance, "The Guiding Assumptions of Liberal Arts Programming," *The Journal of Higher Education* 33 (1963): 181-90.

McConnell observed that general education evolved as a "movement" to reexamine and revitalize the nature and purpose of liberal education. The early proponents of the movement "believed that correctives were badly needed."[3] General education was a reaction against "overspecialization," against the pursuit of special, professional, or disciplinary interests rather than the "cultivation" of the liberally educated man. It was a reaction against curriculum fragmentation and a longing for wholeness and unity of knowledge, a reaction against the growing power of the sciences and an attempt to reassert the importance of the humanities. McConnell suggested that, more than anything else, general education was a protest against formalism in liberal education. Harold Taylor, writing in the same volume, considered the philosophical foundations of general education programs and concluded that general education should provide an "orderly and unified system of ideas and values," insist upon "unity, integration, and the development of liberal values," and reunite disparate and unrelated elements of the college curriculum.[4]

Paul Dressel and Lewis Mayhew, who directed a major effort in evaluation of general education, observed that:

> The general education movement at its inception derived its energy from the fact that it was a protest against the compartmentalization of knowledge and the proliferation of courses, and the associated evil of the free elective system. It developed in refutation of

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[3] T. R. McConnell, "General Education: an Analysis," *Fifty-First Yearbook of the National Society for the Study of Education: Part I–General Education,* N. B. Henry, ed., (U. of Chicago Press, 1952).

[4] Harold Taylor, "The Philosophical Foundations of General Education," *idem.*

> the Germanic conception of a university as essentially a research-oriented institution. It decried the tendency of American scholars to be more concerned with the content and logic of their subject than with undergraduate students as individuals.[5]

Perhaps the last major book to be written on the subject of general education was Bell's *The Reforming of General Education*, in which he observed that the basic aims of general education programs were to: (1) achieve an ideological consensus; (2) preserve and extend the traditions of Western civilization; (3) strike out against specialism and for a reinstatement of the humanities; and (4) strive for integration of knowledge, for wholeness.[6]

Bell described in detail the general education programs of Harvard, Columbia, and Chicago, and left the impression that the status of general education was deteriorating. He noted that it was difficult to distinguish between departmental courses and general education courses, and suggested that general education's uphill battle against the pressures of specialization, professionalism, and pluralism was in severe decline—if not altogether lost. Bell concluded with a "third tier" proposal for general education in which students would master the history and tradition of Western civilization as well as a discipline or disciplines, extend this mastery to "subjects," and then come to the "third tier," the general education element of the program.

General education frequently has been the focus of faculty debate—sometimes for educational and sometimes for noneducational or "practical" reasons. The pressures and obstacles have been numerous, including outmoded curricula, political log-rolling, inexperienced and overly specialized instructional staff, attempts at mass-produced educational economy, conflict with university reward systems geared to science and the symbols of science, and rigid program standardization in indifferent bureaucracies. Eble reviewed developments that led to dissatisfactions with the general education program at the

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[5] Paul L. Dressel and Lewis B. Mayhew, *General Education: Explorations in Evaluation* (Washington, D.C.: American Council on Education, 1954).

[6] Daniel Bell, *The Reforming of General Education* (New York: Columbia University Press, 1966).

University of Utah and found, for example, too few qualified faculty to teach the courses, a failure to adapt to the better preparation of Utah students in high schools, a continuing growth of departmental credit demands, an obvious rigidity in general education "requirements," and an overly extensive use of graduate teaching assistants.

In very large part, the difficulties of general education have come from its sometimes valiant attempts to swim upstream against the major currents of society and against the dominant forces in American colleges and universities. In the latter case, it may be useful in a speculation about future directions in general education to note some of the major trends that appear to have special significance for the future course of general education programs as well.

First to be noted, perhaps, is the expansion in the proportion of youth attending college. Fewer than two million students were enrolled in American colleges and universities in 1945; the figure grew to three and one-half million in 1960, and in 1970, stood in excess of of seven million. Not only are more young people in college, but an increasing *proportion* of young men and women are completing high school and going on to college. In 1955, for example, 62 percent of American youths graduated from high school and one half of them went on to college. Today, over 80 percent finish high school and 55 percent of these graduates go on to college. College attendance, in short, is no longer the privilege of a select, fortunate minority, but the expectation of a growing majority. "Universal" postsecondary education is being discussed in terms typically reserved for elementary and secondary education.

Students coming to college, however, have changed as a casual glance around the contemporary campus will document. Still, changes obvious to the eye may obscure less obvious but more significant changes. Although students may be brighter than earlier generations of college students and come from better secondary schools, the range of abilities from highest to lowest has never been as great. It is also obvious that today's college student tends to be more sophisticated, more urbane, more aware of the social environment in which he lives, and less bound by traditional values and ideologies than his predecessors.

Just as there has been a general weakening of the standard orthodoxy and a growing diversity and heterogeneity in value systems in society at large, the college campus has become more pluralistic. Societal trends have been exacerbated by the entry of new student populations not previously served by higher education. Students are taught by faculty members who themselves come from diverse backgrounds and subscribe to a wide range of values.

And, of course, the missions of colleges and universities have themselves become more pluralistic. Instruction goes on in institutions in which undergraduate education must compete with graduate education, basic and applied research, and a variety of other professional and public service activities. Just as it is difficult to obtain consensus in society at large, it is more difficult to obtain consensus on college campuses which now contain more diverse and disparate interests and values.

One must also note the rise of professional values and the power of professionalism in colleges and universities and the growing emphasis on the disciplines, with a decline in concern for the liberal arts as instruments of human development. Because the reward structure of the university has tended to be based on and governed by professional rather than organizational values, faculty members have tended to concentrate on those activities most congruent with professional concerns. Increasing emphasis has been placed on the creation of new knowledge, less on its transmission; more value has been assigned to publication of one's findings and less to the synthesis and integration of the work of others; and greater attention is given the classroom as a place to spot and develop future scholars in the discipline, while there is less apparent interest in the role of colleges and universities in developing students as persons. Resulting is a paradox in which colleges and universities—with the strongest, ablest, best published, most highly qualified faculties of all time—are unable to generate complimentáry accolades in the area of undergraduate education.

The growing strength of the academic department is related to the growth in professionalism as well as to the growth in size of colleges and universities. The department is an organization of professionals, governed by professional values, standards, and traditions. As professionalism has gained strength in the university, the academic department has been one of the primary beneficiaries. Moreover, as universities have grown in size, it has become necessary to delegate, to decentralize, and to grant increasing autonomy to the major operating units of the university. Departments have gained economic and political as well as ideological strength in the process.

Finally, it must be noted that there is less consensus on means and ends in higher education. The successes of the past have led society to a dependency on colleges and universities as instruments of power. Faculty members know the university has an unparalleled capacity to advance the cause of the disciplines and professions and to create new knowledge. Increasing numbers of students are less concerned with "making it" in conventional academic or societal terms and more obsessed with understanding themselves as persons. There is little evidence to suggest that students, faculty, administrators, and society at large are near discovery of a common ground on these matters and the probability of a continuing if not a growing disparity is substantial.

Perhaps it is also interesting to speculate on that which has not changed. What in this time of turbulence on college and university campuses has remained firm? The answer, of course, is that very little change has come about in the undergraduate curriculum. Although there have been some minor modifications and a likely strengthening of professional standards, general education programs as well as other aspects of the curriculum have remained essentially the same. Along related lines, the techniques of college instruction have not changed greatly, with the three-credit course; the fixed-length semester or term; normative grading; and lecture, discussion, and laboratories continuing as the essential elements. Those changes that have come about in general education have, for the most part, been token or surface changes. A review of undergraduate education by Dressel in 1968 did suggest that new instructional approaches such as independent study, honors programs, integrative seminars, new "climates" for leadership, experimentation in grading, study and travel abroad, work-study programs, and social and community service experiences were being tried on some campuses. A comparison of undergraduate curricula changes between 1957 and 1967 in 322 institutions offering liberal arts programs, however, indicated very little change in the essential framework and in the basic assumptions of the general education programs during this period. Those changes that were identified tended, in the main, to be minor procedural adjustments:

1. Formal requirements in English composition, literature, and speech decreased;

2. Foreign language requirements increased, with two years (or the equivalent) being by far the most common requirement;
3. The use of proficiency tests for meeting requirements in writing, speech, and foreign language increased;
4. Requirements in philosophy and religion were reduced with these subjects more frequently appearing as options in a distribution requirement;
5. The specification of mathematics as a requirement or an option increased;
6. There was some tendency to reduce physical education requirements and to eliminate credits and grades for it;
7. Basic and general requirements remained at approximately 37 percent of the degree requirements and were roughly divided into 17 percent for humanities and 10 percent each for social and natural sciences.[7]

But Morison, writing in a 1970 issue of *Daedalus*, observed: "Many of us who had such a liberal education are grateful for the experience and feel that it has enriched our outlook on life. Whether it has made us better husbands, fathers, business executives, or citizens remains an open question. What is clear, however, is the fact that general education has fallen upon hard times."[8]

Morison went on to observe that general education is failing because, among other reasons, it gives students an unrealistic, limited, and too favorable view of society as it now is, and that it actively discourages students from learning how to change or reform the existing order. He also noted that while students do not find particular vocational or professional relevance in general education programs, neither do they find experiences that provide them with a sense of personal value or meaning.

The vulnerability of general education programs also has been pointed out by Shoben, who has speculated that "contemporary culture is caught between two major revolutions, one nearing completion and the other just beginning."[9] He concludes with the observation that patchwork tinkering with the liberal arts or general education curriculum will accomplish little of anything of significance and that only a fresh start will restore constructive vitality.

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[7] Paul L. Dressel and F. H. DeLisle, *Undergraduate Curriculum Trends* (Washington, D.C.: American Council on Education, 1969).

[8] R. S. Morison, "Some Aspects of Policy-Making in the American University," *Daedalus* 99 (1970): 609-44.

In his recent and highly controversial book, *The Greening of America*, Charles A. Reich suggested three major periods in the evolution of the "new culture." Perhaps at some risk, one might suggest three periods in the twentieth century evolution of higher education curricula. During the first quarter of the century, for example, many college curricula still held out the vision of the liberally educated gentlemen, the tutoring of future leaders and potential opinion setters in a growing democracy. By comparison, the social institutions were weak and the communication mechanisms were crude. Preservation and extension of a common culture was an important business, for although America prided herself in having no kings and princes, the small, select portion of the nation's young enrolled in institutions of higher learning represented in a real sense the anointed, educated for positions of power and authority in the major social institutions and professions. The attempts of general education to strive for an ideological consensus, to concentrate on Western civilization, to emphasize the humanities and to integrate and synthesize knowledge were perhaps most appropriate and successful in this era.

A second period might be suggested to have emerged in tandem with the growth of the modern industrial state, certainly in evidence prior to World War II but overwhelmingly obvious since that time. This period was, and is, an era of production and performance. McConnell, writing in 1944, suggested that the fundamental elements of general education programs should be expressed not as fields of knowledge, but as the way in which educated men might properly be expected to behave, or in terms of *performance*. Shoben reinforced this view some quarter of a century later when he held that:

> Industrial cultures, regardless of their politics, focus on problems of producing and delivering the goods and services that are defined as real wealth. The

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[9] E. J. Shoben, Jr., "The Liberal Arts and Contemporary Society: The 1970s," *Liberal Education* 56 (1970): 28-38.

> values of this focus crystallize around such characteristics as self-discipline, a prudent and foresightful orientation toward the future, work and economic success, and competitive striving. Institutionally, organizational patterns are judged primarily by the degree to which they support productivity rather than by the quality of participation that they invoke.[10]

The common denominator that general education sought to provide not only made better engineers, businessmen, clergy, physicians, scientists, journalists, and lawyers, but it also provided the "standardization" and interchangeability that proved so immensely functional in the modern industrial state.

The outlines of a third period, presently emerging, remain clear to the view of most observers. What does seem evident is that is *is* emerging. Although Chickering in his 1969 award-winning book still talked, as did McConnell, of performance, he spoke of it in a different dimension. While McConnell focused on matters of communication through writing and speaking, of building social relationships, and working cooperatively, Chickering spoke of developing autonomy, managing emotions, and establishing identity.

Shoben has gone further to suggest:

> A new revolution, the post-industrial revolution, has struck. For large numbers of Americans, relative affluence and basic political freedoms are no longer goals to be striven for; they are established and can be taken for granted. The ethic of production has lost its force, and the institutions, the norms, and the reward systems of industrialism seem antiquated and constrictive. What matters is less success and security and much more the experience of joy, the stretching of personal consciousness, the free expression of self.[11]

Although few see clearly even the broad outlines—let alone the precise detail—of the "third period," two points are evident: society and its institutions of higher learning are in a period of rapid change; and the undergraduate curriculum—especially the general education portion—must also change.

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[10] Ibid., pp. 32-33.
[11] Ibid., pp. 33-34.

The reformulation of general education programs must recognize the substantial changes that have taken place in American higher education during recent decades, for it is unreasonable to suppose that all of society and the bulk of the university can change while general education programs remain set in concrete. The assumptions on which general education programs rest must be reexamined and tested. Can general education programs reasonably be expected to achieve an ideological consensus in a period of growing societal pluralism? Can general education emphasize the extension of the traditions of Western civilization when it is obvious to all, especially the young, that the boundaries of contemporary culture extend far beyond this restricted definition? Must the humanities be the instrument for striking out against science and technology, or should they infuse our technological culture and its scientists with more genuine humanness?

Speculation about the general education programs of the future might begin with pointing up certain qualities that should *not* be present. It is clear that the rigid self-rightesouness of inflexible course requirements of the past is *not* a high-priority quality for the general education model of the future. *Neither* should general education continue to serve as the institutional talent-screening device, the major contribution of which is to weed out those students somehow overlooked by the admissions officer. The general education program model of the future should *not* place primary emphasis on the creation of an efficient production line to mass produce lower-division instruction so that savings can be reinvested in upper division and graduate education. *Neither* should general education programs be distinguished primarily by the number of stipends they provide to beginning graduate students.

New organizational alternatives must be devised in the general education programs of the future. Single administrative units for general education—such as general or basic colleges—bring on a variety of problems including second-class status for the faculty, conflicts with professional values and interests, risks of impersonal instruction, and rigid course requirements, to mention a few. The alternative of leaving general education to the departments brings different but equally serious difficulties. There is no obvious answer; but the creation of a series of contrasting general education institutes or the use of openly competitive lower division cluster colleges may present an interesting contrast to the status quo.

Professionalism has so captured colleges and universities, including the liberal arts, that the fight between general education and "specialism" can no longer continue. Those in the disciplines and professions must finally decide whether they really wish a curricular monopoly and, if not, they must move to support a redefinition and revitalization of general education. In turn, the current closed market in general education—single-source suppliers—must also be broken with the introduction of a wider range of competitive and attractive alternatives.

In the end, future programs of general education must ask the question: Whose interests are served? Hopefully, the answer is congruent with a commitment to future generations of youth and to the society of which they, as well as the institutions they attend, are a part. Achieving these ends must rank high on the now well-filled agenda for academic reform.

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Shoben, E. J., Jr. "The Liberal Arts and Contemporary Society: the 1970s." *Liberal Education* 56 (1970): 28-38.

> The author suggests that our present culture is caught between two major revolutions: (1) the industrial revolution with its emphasis upon production, self discipline, and competition; and (2) the postindustrial revolution with emphasis on "the experience of joy, the stretching of personal consciousness, the free expression of self." What is needed, Shoben suggests, is a major overhauling of the liberal arts curriculum, which takes cognizance of the postindustrial era.

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> The author suggests the possibility of a reverse order in the normal liberal arts program sequence that would offer each student a chance, from the very beginning, to move ahead as fast as he could in a selected field of interest. Assumptions in support of current practices are examined and alternative

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> This book has been called a monument. Its theme is that colleges need reforming and that findings drawn from the social sciences are relevant to reform. Thirty social scientists present material. The volume focuses on undergraduate liberal arts education. (An abridged edition is available in paperback.)

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> An historical review of the origins and development of academic degree structures. Analyzes the influence of degree structure upon such aspects of higher education as admissions, curriculum, and enrollment. Alteration of the degree structure may be one approach to revising the general education program. Spurr also offers his own synthesis of "an idealized and generalized system of degree structures for American higher education."

PENNSYLVANIA'S "STATE-OWNED" INSTITUTIONS: SOME DIMENSIONS OF DEGREE OUTPUT*

William Toombs and Stephen D. Millman

The state-owned institutions of Pennsylvania have an identity of their own created from a history that is in part similar to the state colleges in other states and, in part, quite distinctive. They have had a major place in the extension of higher education to citizens of the Commonwealth and in the cultivation of professional competence in the schools. Their current importance lies in an imminent departure from this tradition rather than its continuation. A major change in the role of state-owned institutions has been in the making for half a dozen years but it is still in embryonic state. Unlike changes in the past which have often been shaped by demographic trends or accidental events, the next directions will be a product of policy decisions. Only a variety of viewpoints and a range of analyses—this study is one—can inform these decisions with facts.

The paragraphs that follow treat the state-owned institutions as an educational system. Justification for such a view is traced in the historical roots, legal and functional development, and current mission of these institutions. To assess the effectiveness of this system, enrollment patterns and degree output are examined, first in comparison with state and national patterns, then as a ratio that is a measure of efficiency. Taken together, these indexes emphasize the strength of these institutions and point toward the next steps in their development.

Taking a Point of View

The time is one in which every formal institution is subject to close scrutiny. Under waves of bold, often radical, criticism we want to know what schools, colleges, hospitals, the courts, even churches, are doing and with what effect. In the search for ways to know what is happening, we are confronted with the more fundamental problems of what to look at and how to see.

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A. The Full Perspective

Scientific tradition presses toward the reductionist approach and atomistic analysis. Experience in the physical and biological sciences encourages examination of the component parts of an issue and the measurement of carefully defined phenomena related to it. More and more, however, the needs of our age seem to require a holistic view, a perspective that will capture the full scope of activity. An analogy for these two approaches is found in the difference between a world seen through a magnifying glass which enlarges the detail but narrows the scope and the "fish-eye" lens which concentrates the cyclorama into a single image. Somehow we were led to feel that the magnifying glass told us more, but now we find that the total view has its utility, too.

In higher education, the search for a comprehensive view has generated a great deal of interest in systems analysis and in global indicators that reflect a summary of the process of education itself. This search has proven to be surprisingly difficult.[1] One of the long-established indicators is degree output and, when appropriately interpreted, it can offer a measure of insight into the operation of an institution, a program, or a collection of institutions.

This study concentrates upon degree certifications at the bachelor's level as a means of gaining perspective on the activities of the state-owned institutions in Pennsylvania. Also included is a collection of descriptive information, much of it in new form, about the number of bachelors' recipients who eventually appear in the Annual Survey of Current Doctorates.

State-Owned Institutions

For several reasons, the state-owned institutions are highly suitable subjects for this kind of study. Their histories show many similarities from the time they became normal schools. These commonalities have been reinforced by subsequent policies and patterns of growth. Many of the major decisions about these institutions are relatively recent (within the last forty years), and we are fortunate in having enough information over that time span to construct a set of basic facts on enrollment and degrees. The data become a medium through which we can look at the similarities and differences among these colleges, their relationship to other kinds of institutions in the Commonwealth, as well as to national norms, and, most important, their progress over time. This material also suggests certain inferences about the policy decisions which have affected these institutions. Like most exploratory studies, its most interesting aspects lie in the questions for further study that arise from the results.

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[1] Ben Lawrence, George Weathersby, Virginia W. Patterson, *Outputs of Higher Education* (Boulder, Colorado: Western Interstate Commission for Higher Education, July 1970). This series of papers explores a variety of approaches. A WICHE commission on outcomes is continuing the evaluation of various indexes and indicators appropriate to colleges and universities.

Underlying the study are two assumptions that require some explanation. First, the state-owned institutions are considered to have the attributes of a functional system. Second, the number of degrees, specifically in relation to enrollment, is an appropriate indicator of an educational system. The first of the sections that follow provides a brief summary of the history of the subject institutions and concludes with some reasons why they may be regarded as a system. Another section treats the possibilities and limitations of degree output as a device for reflecting the undergraduate educational process. Data on enrollments and degrees will be followed by data on baccalaureate origins of doctorates. Finally, acting on the scholar's license, some inferences will be drawn.

Historical Notes on the State Colleges of Pennsylvania

Like most vigorous institutions, the state-owned institutions have a coherent history of their own and they also hold a role in the history of the Commonwealth. Some of the major recurring themes of that history can be offered as an introduction, and a summary as well, to the more detailed discussion that follows:

Summary

1. There is ample evidence of strong commitment to higher education throughout the history of the Commonwealth.
2. Tied to this commitment has been an aversion to centralized control of higher education.

3. The early and continuous practice of aid to private and quasi-public institutions of higher learning undertaken in a variety of forms fits with the two basic views listed above.
4. While the Commonwealth has never failed her colleges and universities, the aid has always come *post facto* often at the point of dire emergency.
5. The colleges and universities now identified as state-owned institutions have a strong tradition of response to the educational needs of the Commonwealth.
6. In developing these responses, they have moved steadily toward a condition of similarity. When the budgeting, management, and review practices introduced for these institutions during the last twenty years are added to the older tradition, they manifest many of the attributes of a coordinated educational system.
7. The integrated nature of this "system" of institutions is visible in the data on enrollment and degrees. This data also confirm the view that these institutions have departed their traditional stereotype and are involved in the creation of a new identity.

The Basis of Public Interest

Higher education has seldom had sustained support in the American Republic on the grounds of its commitment to esoteric learning. The linkage of college and university with the public weal has always had utilitarian ends in view. The sectarian college was expected to produce preachers with theological purity. The seaboard universities were expected to mix enough navigation and surveying with Euclidean geometry to keep ships afloat, land tenure clear, and account books balanced. Technical and scientific schools followed the visions of van Renssalaer, Carnegie, Pratt, Drexel, and Cooper who saw the useful linkage of science, learning, and industry through technology. And through all the years ran a concern for preparing teachers who could advance the young beyond the knowledge state of their struggling parents. It is the thread of this last tradition that many state colleges follow.

In some ways, the development of the state colleges of Pennsylvania mirrors the historical pattern in other states. Dunham portrays that development in its national character as follows:

> If the institution is very old, it is likely that it was founded as an academy or seminary and then evolved

> into a normal school during the period when most normal schools were being founded. . . . The normal school to prepare elementary teachers becomes a teachers' college to prepare secondary as well as elementary teachers. Then, as the state seeks to respond to increasing demands for higher education, the teachers' college expands its function to become a multipurpose state college and perhaps a university.[2]

While the state colleges of the Commonwealth have followed the general pattern described by Dunham, certain characteristics distinguish Pennsylvania traditions from those of other states. Several well-known works speak to these differences.[3]

The Pennsylvania Patterns

In Pennsylvania, as in many of the older states, support for education from public funds had a peculiarly passive role. No institution of higher learning in the Commonwealth was founded as a public institution. (The community colleges are the recent exception.) Even the land-grant university, Penn State, owes its beginnings to private subscriptions. The fact that it is the only one of five land-grant institutions founded in that manner to survive portrays another aspect of the Pennsylvania tradition. Reluctance to found institutions did not translate into unwillingness to preserve institutions. Concern for their survival was strong and, when the occasion demanded, grants were made from public funds. The College of Philadelphia (University of Pennsylvania) and Dickinson College received emergency grants before 1830.[4] In ensuing years, assistance from the Commonwealth took many forms but it never quite reached the point of being a "program" or "system" of aid to higher education. William A. Cornell, in his account of financing for higher education, makes the point succinctly:

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[2] E. A. Dunham, *Colleges of Forgotten Americans* (New York, McGraw-Hill, 1969), pp. 36-37.

[3] J. P. Wickersham, *A History of Education in Pennsylvania* (Lancaster, Pa.: Inquirer Publishing, 1886, p. 608); L. C. Walsh and M. T. Walsh, *History and Organization of Education in Pennsylvania* (Indiana, Pennsylvania: R. S. Grose Printing Shop, 1930, privately published), p. 321; S. Sack, *The History of Higher Education in Pennsylvania,* v. 11 (Harrisburg: Pennsylvania Historical and Museum Commission, 1963), p. 513.

[4] Frederick Rudolph, *The American College and University* (New York: Vintage Books, 1965; originally 1962), pp. 186-187.

> The Commonwealth of Pennsylvania is unique in that it has supplied some financial aid to some institutions of higher education from time to time since the beginning of the State. No other state has a practice of state aid that is anything like that of Pennsylvania.[5]

The starting point for considering the historical lineage of the state colleges lies in the 1830s. Before that date and well into the nineteenth century, education at every level beyond the most elementary was viewed as a private matter and a family responsibility. An exception to this view, although distant from the New World, was well known.

> The idea that education was a function of the state obtained in only one Western country—the Kingdom of Prussia. . . . In America, meanwhile, education (in the eighteenth century) continued to be regarded as a private or semi-private enterprise, a responsibility left by the government to the church and the parents.[6]

If schooling was a private matter, then it followed that the provision of teachers for the schools was also a private concern. Describing the early 1830s in a neighboring state, Dunham indicates:

> There was agreement about the need for teachers, but disagreement about who should train them—the existing academies or a new system of publicly financed state normal schools. The normal school idea smacked of Prussianism and strong central government.[7]

The Prussian approach to both education and teacher preparation did, however, gain favor in the rest of the Germanic states and in France. The English, from whom most of our early traditions stem, resolutely held to the notion of education and teacher training as nonpublic matters.

> When the question of establishing special schools for training teachers was taken up seriously in Pennsylvania, the advocates of such schools had a choice between . . . the state-supported and state-controlled

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[5] W. A. Cornell, "The Historical Development of the Patterns of Appropriations for Institutions of Higher Education by the General Assembly of Pennsylvania to 1960." (Dissertation, The University of Buffalo, 1962), pp. 2-3.

[6] A. E. Meyer, *An Educational History of the American People* (New York: McGraw-Hill, 1967), p. 121.

[7] E. A. Dunham, *Forgotten Americans*, p. 29.

> systems of Germany and France, and . . . the privately-controlled, individualistic, decentralized plan of England. The former was best known and best advertised in America, and it was the one adopted, with modifications, by Massachusetts and the other states, but the English plan was the most attractive to the decentralized, heterogeneous, individualistic people of Pennsylvania. This was the most German of the states, but it was also the most decentralized and even the German settlers had no desire to go back to the Prussian centralization from which many of them had escaped.[8]

Whether for this reason or some other, Pennsylvania set out very early on a course of recognizing and, at various times, financially assisting institutions of higher learning.

Steps Toward Public Responsibility

Private Grants

Just as the Great Awakening of the eighteenth century spawned Princeton, Brown, Rutgers, and Dartmouth, so new forms of public consciousness in the 1820s and 1830s generated new colleges and academies. This time the ideational forces mixed religion with Jacksonian democracy and with an urgent sense of progress. Education participated fully.

During this period, momentum began for what has been called "the free school movement." New schools were built, new methods and new concerns for pedagogy were developed, and many educators attempted to stir the public, seeking support for more comprehensive education.

In 1830, the trustees of Washington College established a Professorship of English Literature. "The educational press hailed the creation of what it called 'a professorship of education' in a Pennsylvania college."[9] One year later, the General Assembly of the Commonwealth acted by granting the college $500 annually for five years on the condition that "the said trustees shall cause to be instructed twenty students, annually, free of expense of tuition for the term of five years; such students to be selected by said trustees, and taught in the elementary branches of an English education in such manner as said trustees shall deem best calculated to qualify them for teachers of English schools."[10]

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[8] L. C. Walsh and M. T. Walsh, *History and Organization of Education in Pennsylvania*, p. 321.

[9] S. Sack, *The History of Higher Education in Pennsylvania*, p. 513.

With the grant to Washington College, the General Assembly took cognizance for the first time of a public responsibility to provide teachers for the common schools. The grant to Washington College was followed in later years by appropriations to other liberal arts institutions pledged to training future teachers, including Jefferson College, Reading Academy, Pennsylvania College (Gettysburg), Allegheny College, and Marshall College.[11]

Financial encouragement to existing liberal arts institutions to establish teacher preparation programs seemed like a natural solution to the very pressing need for teachers. As Borrowman points out:

> One can well argue that teacher education is among the oldest functions of the liberal arts college and university. The arts degree awarded by the medieval university was, as is generally known, a certificate of admission to the guild of professional teachers. . . . In the colonial and early national periods, then, the course of the liberal arts college probably contained the best available knowledge relevant to the education of teachers.[12]

As the case has often been, the magnitude of the problem forced public action. Private colleges in Pennsylvania could not provide the numbers of teachers needed to support the continuing expansion of the common schools. In 1837, Thomas Burrowes, then Superintendent of Common Schools for the Commonwealth, critically assessed the situation.

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[10] Act 202, *Laws of Pennsylvania,* 1830-31.

[11] J. P. Wickersham, *A History of Education in Pennsylvania,* p. 608.

[12] M. L. Borrowman, *Teacher Education in America* (New York: Teachers College Press, 1965), pp. 1-3.

> The colleges have already been tried as a means of supplying teachers and with little success. Within the last eight years, $48,500 have been given by the State to five of these institutions, principally on the condition that they should instruct a certain number of persons . . . for teachers of English schools. . . . It is doubted whether there are, at the present moment, in the whole State one hundred persons thus educated, permanently and actually engaged as teachers of primary schools. Hope from this quarter is dead.[13]

Public Action

One year later, Burrowes put the matter more bluntly and suggested an alternative course of action.

> The want of more and better teachers is by far the greatest difficulty of the system. . . . [I have] come deliberately and unhesitatingly to the conclusion that the best mode is the establishment of *separate free state institutions* for the instruction of teachers. [Emphasis his.] [14]

Caution held the day, however, and it was 1857 before sufficient interest could be gathered to produce legislative action. In that year, a law was passed to establish twelve normal school districts in the state, each of which could charter a normal school. Though known as "state normal schools," each institution was to be privately owned.[15]

It was not so much a direct solution to the problem of teacher shortage as an experiment in economy. The state did not intend to bear the costs of the normal schools.

> The money to conduct the school was expected to be collected from school districts who would send students to the schools on district accounts. In return, the students were expected to return and teach for three years in the district. . . . The system did not work out for no school reported more than one or two students on such accounts.[16]

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[13] S. Sack, *History of Higher Education*, p. 519.
[14] Ibid., p. 526.
[15] Act 619, *Laws of Pennsylvania*, 1857.
[16] W. A. Cornell, *Historical Development*, p. 72.

Sack points out that the law did provide a governance pattern for these institutions which reflected public concern but stopped short of a state funding scheme. In fact, the law specifically stipulated that "the pecuniary interests of each of said schools shall be managed, and the general control exercised by a Board of Trustees . . . to be chosen by the contributors or stockholders." The act, according to the Superintendent of Common Schools, "simply contemplated the establishment of a certain number of private institutions for the training of teachers under some general state supervision. The state, at first, made no appropriations to them and designed to make none."[17]

Each school had to be incorporated and funded by local stockholders, so there was delay in many areas. A number of academies were functioning adequately at the time of the Normal School Act and with slight revisions these schools could apply for recognition under the law. The first normal school was acknowledged in 1859, but it was 1893 before all twelve districts had a normal school chartered.

The twelve normal schools set up under the Act of 1857, and their dates of recognition are as follows:[18]

Millersville	1859	Shippensburg	1873
Edinboro	1861	California	1874
Mansfield	1862	Indiana	1875
Kutztown	1866	Lock Haven	1877
Bloomsburg	1869	Slippery Rock	1889
West Chester	1871	East Stroudsburg	1893

A thirteenth district was formed when a petitioning group in Clarion sought recognition, although there was already a recognized normal school in the same normal school district (Lock Haven). Clarion was recognized in 1887.[19] The constellation of institutions was completed in 1907 when Cheyney Institute for Colored Youth began to receive state aid.[20]

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[17] S. Sack, *History of Higher Education*, p. 539.

[18] L. C. Walsh and M. T. Walsh, *History and Organization*, p. 323.

[19] W. A. Cornell, *Historical Development*, p. 97.

[20] Ibid., p. 102.

In pursuit of a policy that is curiously modern in its overtones, the Commonwealth, at the time of the Civil War, began to provide support to individual students through capitation grants. Starting in 1866, funds were appropriated by the General Assembly to be used for those students who signed a declaration that they intended to teach after graduation.

This *quid pro quo* for students in teaching fields never extended to other supported professional programs—medicine, veterinary study, agriculture, or law—but it persisted in the teacher institutions until the 1960s.

In 1874, another major step was made. Pennsylvania adopted a new constitution which made the normal schools a part of the public school system. The institutions remained private, but the state paid, in addition to the student subsidy, a share of the costs of maintaining the schools. Financial interests of the state in these schools increased; so did the control.

> As the Legislature began to pour funds into the State normal schools, it soon reached a point where it had "more money invested in some of the normal schools than have individuals, and about as much in others, and a policy has been forced upon it, not at first contemplated, of demanding a direct voice and vote in their management" [in the words of the Superintendent of Common Schools, 1873].[21]

In the year 1911, a new comprehensive school code was enacted. One provision of the act allowed for the purchase of normal schools by the state.

> Section 2032: In order that the State Normal Schools may be owned and controlled by the Commonwealth, for the better preparation of teachers, the State Board of Education is hereby authorized to inquire into the propriety of purchasing any State Normal School, and if it is found that the stockholders, or other owners thereof, are desirous of selling and conveying the property of any such institution to the Commonwealth, it shall be the duty of the State Board of Education to make the most advantageous arrangements possible for the purchase of same.[22]

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[21] S. Sack, *History of Higher Education*, p. 539.

[22] Public Law 309, *Laws of Pennsylvania*, 1911.

The final step toward making these teacher preparation institutions a responsibility of the state was soon taken. After the law was passed, but before any school had been purchased, Holland wrote:

> With the exception of Delaware, Tennessee, Alabama, and Florida, all states of the Union maintain separate normal schools for the training of teachers which receive funds from the public treasury. In Pennsylvania alone, these schools are private corporations over which the State exercises little effectual control.[23]

The dates and prices of purchase of the State Normal Schools are as follows:[24]

West Chester	1913	$ 78,000
California	1914	136,138
Edinboro	1914	58,497
Lock Haven	1914	94,000
Bloomsburg	1916	161,000
Clarion	1916	69,653
Slippery Rock	1916	42,775
Kutztown	1917	252,000
Millersville	1917	59,000
Shippensburg	1917	38,100
East Stroudsburg	1918	172,665
Indiana	1920	299,700
Mansfield	1920	176,870
Cheyney	1921*	

[*A separate law was enacted in 1921 to authorize the purchase of Cheyney.]

State Teachers' Colleges and After

By the time that the last private normal schools were being purchased by the Commonwealth, arrangements were being made to convert them into degree-granting collegiate level institutions. Legislation was passed in 1921 (the Edmonds Act) to allow change to state teachers' college status, and the first schools were ready to be so certified in 1926. One year later, the remaining institutions became state teachers' colleges.

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[23] E. O. Holland, *The Pennsylvania State Normal Schools and Public School System* (New York: Teachers College Press, 1912), p. 5.

[24] L. C. Walsh and M. T. Walsh, *History and Organization*, p. 338.

In 1961, the state teachers' colleges became state colleges. The change in name was not merely a semantic adjustment. The enabling legislation specifically set the directions for new programs:

Section 2003: Their purpose shall be to serve as institutions and centers of learning for the best possible education of the youth of Pennsylvania in the arts and sciences and the education of teachers and for such other purposes as may be determined by the State Council of Education.[25]

To fulfill this new status, each institution took aboard a mentor from an established liberal arts college and by 1964-65 the new institutions had developed new programs for noneducation majors. The forms these programs assumed was not a replica of the traditional liberal arts but a more generalized study pattern and the degrees were granted in "Humanities," "Social Science," and "Natural Science" rather than in discrete disciplines. The unworkability of both nomenclature and program led to the creation of a disciplinary major in English in most institutions and to the construction of programmatic majors in other fields. Official acknowledgement of the *de facto* condition came slowly with blanket approval for twelve disciplinary majors arriving in September 1970.

Ten years after the State College Act, the state-owned institution was treated in the Master Plan 1971 which had as a principal objective:

> to define institutional roles and relate them to the needs and resources of the Commonwealth.[26]

The mission assigned to the state-owned group has a peculiarly limiting implication stating:

> to provide baccalaureate programs in the *general arts and sciences* and in *education* with increasing emphasis upon upper division work to allow for community college transfer students. /*Emphasis added.*/

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[25] Act 552, *Laws of Pennsylvania*, p. 608.

[26] Pennsylvania State Board of Education, *1971 Master Plan for Higher Education in Pennsylvania* (Harrisburg, 1971), p. 31.

The idea of limiting state-owned institutions to a role only slightly removed from the teacher training tradition persisted in the State Council interpretation in 1961 and the Master Plan in 1971. But to continue it further diverts attention to the more urgent issue of how this valuable educational resource can be applied to meet the upcoming needs of business, education, technology, science, and humanity itself within the Commonwealth.

The State-Owned Institutions as a System

One reason for the popularity of the notion of a "system" lies in the flexibility of the term. It permits sophistication or simplicity depending upon the level of abstraction and the degree of elaboration.

> A system is a set of objects together with relationships between objects and between their attributes.[27]
>
> System theory is basically concerned with problems of relationships, of structure, and interdependence rather than with the constant attribute of objects.[28]

Both of these statements emphasize the characteristics which encourage an observer to treat the state-owned institutions of Pennsylvania as a system. It is the relational quality. Over the years, a number of forces have acted to bring these institutions into a kind of network which, in spite of their apparent autonomy, links them into a common destiny. First, there is the force of history touched upon in the previous paragraphs and confirmed by common legal status. Then there was the budgeting practice which placed all these institutions together with the public school appropriations. Common standards of construction have been used by the General State Authority to specify buildings and equipment. Allocating special programs—music, physical education, library science—among the institutions recognizes their systemic nature. Academic programs receive the same review under the same criteria. What data there are on student characteristics show considerable similarity from one campus to another. Lately, we have the unusual linkage of a common union contract for faculty at all these institutions.

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[27] A. D. Hall and R. E. Fagen, "Definition of a System," *Modern Systems Research for the Behavioral Scientist*, N. Buckley, ed. (Chicago: Aldine, 1968), p. 81.

[28] D. Katz and R. Kahn, *The Social Psychology of Organizations* (New York: John Wiley & Sons, 1966), p. 18.

The unique aspect of this system is that the relationships needed to fulfill the definition arise from common operational patterns rather than from a formal, centralized administrative structure. The state-owned institutions give an appearance of considerable independence in their operation but the conditions under which they act insure a narrow range of outcomes. It is a system in its operations and in its effects. It is a system that has evolved rather than a system that has been designed.

For this study such a conclusion stands as an assumption. Acting upon it we are able to aggregate indicators such as enrollment and degrees for all these institutions and treat them as a system output.

Degree Output as a Measure of System Effectiveness

Education at every level is forever suspended on the horns of a dilemma. In its essential aspects, the process of learning is an intensely personal one. Intellect grows, independence increases, sensitivity is refined, and skills develop within the individual who is at once the subject and object of education.

Of almost equal importance and of more common concern is the collective aspect. The settings in which instruction is given, the social interaction and structure that characterize them, and the summary of its outcomes are important. For purposes of planning, management, reporting, and evaluation, the institutions of education have identities of their own. We make substantial assumptions about the relationships between the individual and the institution but they are seldom completely acceptable. Much of the contemporary criticism of education strikes at incongruities between the individual's needs and the instituion's attempt to meet them.[29]

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[29] Ivan Illich, *Deschooling Society* (New York, Harper & Row, 1970). Illich's work represents the most extreme attack on the school form.

Degrees As An Indicator

In using degree output as an indicator, however, we accept the assumption that the individual experience and the institutional program are two sides of the same coin. The approach emphasizes that individual outcomes are thoroughly consistent with the total design. The degree represents a focal point at which interests of the individual, the society, and the institutions come together. It has a special legal status. It is the object of both student and faculty intentions. It is the terminal and summary point for curricular programs. In short, the awarding of a degree is the end product of a long chain of relationships based upon logical assumptions. Some may be wrong and others may be criticized, but the principal features are still sound.

As a means of observing performance in a group of related institutions over time, the measurement of degree output has much to recommend it. Degrees are discrete units that are officially and quite accurately recorded.[30] As a matter of fact, they are probably tallied with more precision than any other datum in higher education. Degrees as a measure have all the characteristics suggested by David O. Brown.[31]

1. Quantifiability. Output must be stated in quantifiable units.
2. Additivity.
3. Divisibility. The measures selected for the system as a whole must be equally available and meaningful for subsystems.
4. Transferability. The measurement system appropriate for four-year colleges must also be appropriate for universities and for junior colleges.
5. Consensus Acceptability. The measures should be credible. A majority of all constituencies should agree that the measures are not inappropriate.

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[30] M. Woodhall and Mark Blaug, "Productivity Trends in British University Education—1938-1962, "MINERVA," September, 1965, pp. 483-498.

[31] David O. Brown, "A Scheme for Measuring the Output of Higher Education," *The Outputs of Higher Education*, Lawrence, Weathersby, Patterson, eds., pp. 29-30.

6. Flexibility. The model must be flexible so that users with different purposes and with different values can employ it for their own purposes.

Apart from simple convenience as a measure, there are deeper and broader implications, both educational and social, to this output. The degree is more than a single point on the flowing curve of educational development. It is a step change announcing the *completion* of training, the certification of competence within a range of recognized standards, and the credentialing or licensing of that competence so that it can be applied over a wide area.

As David W. Breneman noted, "The decision to measure university output by degrees awarded directs our attention to an obvious but important distinction. Universities are engaged in two closely related but conceptually separable activities, education and certification. By defining degrees as the output measure, we are explicitly concentrating upon the university's role in certification as opposed to education."[32]

British analysts of university performance have accepted this quantum jump in educational value. "The economic value of university education to the student attaches in the early years mainly to *completed degrees*. A student who drops out, or is thrown out for inadequate work, gets little or no early economic value for the work he has performed."[33]

In American higher education, acceptance of the full importance of degree completion has come more slowly mainly because any amount of college has had some palpable economic advantage. As the varieties of degree options increase and as community college programs expand, this tolerance for noncompletion may decline. In some respects, this reevaluation is already with us:

> For many purposes, the fact of earning a B.A. degree . . . may be more important to the student making his way in American society than the reputation of the

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[32] David W. Breneman, "An Economic Theory of Ph.D. Production" (Paper P-8, June 1970, Office of the Vice President of Planning & Analysis, University of California, p. 3). Also, see p. 22 on the "Step Change" aspects.

[33] Charles F. Carter, "The Efficiency of Universities," *Higher Education* 1 (February 1972): 78.

> institution where he earned it, or how well he did relative to his classmates, or what he actually learned. . . . For an institution, the number of earned degrees produced in each type and level of program is an important measure of achievement.[34]

The degree is also the designed objective of an educational program. It is the goal toward which courses and curricula are pointed. Even further, it has a relational value with respect to other degree designations on the same level as well as those above and below in the whole broad system of higher education. Society perceives the attainment of a degree as the *raison d'etre* of higher education. In at least one contemporary proposal for funding, dollars per degree was suggested as the medium of reimbursement.[35]

Attainment of a degree is also the outcome intended by all the participants. Faculty who plan the learning environment and participate in it along with the students have the degree as an intended outcome. In comparison with other nations, it is also clear that our higher educational system is concentrated on training as many individuals as possible to a level of certifiable competence rather than upon screening out functions.[36]

Degree output is also a good indicator of the educational process in that it is sensitive to a variety of internal changes. If the calendar is altered, if fees rise rapidly, or if course requirements are radically revised, the ultimate effects will be reflected by the number of degrees awarded.

In summary, degree output may be taken as a suitable indicator of undergarduate study because it reflects program design, societal expectations, and the intentions of both faculty and students.

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[34] F. E. Balderston, "Thinking About the Outputs of Higher Education," Lawrence, Weathersby, Patterson, *The Outputs of Higher Education*, p. 14.

[35] Select Committee on the Future of Private and Independent Higher Education in New York State, *New York State and Private Higher Education* (Albany, N. Y.: Bureau of Publications, January 1968, "The Bundy Report.")

[36] Frank Bowles, *Access to Higher Education* (New York: Columbia University Press, 1963). See chart on page 77 for a graphic illustration of the effects of this philosophy.

Because "going to college" has its own social value and because of the relatively low completion rates, American higher education has been slow to accept degree output as an index of institutional performance. But if "measurement without theory is a delusion," then we must acknowledge degree production as a measure for it is the focus of our theory, the objective of its educational concepts, intentions, and processes.

Some Refinements of the Data

A Standardized Measure

While the absolute number of degrees produced may be useful for some purposes, we really need a way of standardizing this output for comparison over time and across institutions. Fortunately, throughout the period under study, the time required for completion of a baccalaureate program—four years—was just about the same at all undergraduate institutions. This stability provides a neat arithmetic relationship between enrollment and degrees. If all entrants received a degree four years later and new freshmen were constant in number, the ratio of enrolled students to degrees awarded would be a simple 4:1.[37] We know that a ratio as low as this is unlikely and the sources of variation come readily to mind.

The most obvious is the large increase in enrollments—very rapid at some times, slower at others—but continuously upward except for the World War II years. The ratio of degrees to enrollment can be used simply as suggested by Harris or Griffiths:

> A university may be represented in a simple model as an input, black box, output system: the input consisting of students, resources, facilities, etc. is passed through . . . an educational process (the black box) and one output is the number of persons earning a degree. . . . In order to compare outputs from different systems and subsystems, the numbers may be

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[37] Lewis B. Mayhew, "Higher Education, Work, and The Professions: An Introduction," *Journal of Higher Education* 43 (March 1972): 169-78. Using cohort analysis California found in 1957, five freshmen were required to produce one bachelor's degree four years later. In 1957, the number had increased to six.

> standardized by dividing the number of degrees by the number of students.[38]

"One approach to analyzing the performance of higher educational institutions is to regard the output of graduates with degrees as a principal product of such institutions and to consider the ratio of degrees produced to degree-credit enrollment as a measure of an institution's economic efficiency."[39]

Or it can be applied in more complex form. One analyst, Robbin Hough, has cited the relationship of students enrolled to degrees granted as a useful expression of the "production function" of institutions of higher learning. From his own studies which treated the effects of scale on this ratio, he offers the following general observations:

> These ratios may be compared with an "idea ratio" of 4.0 for a four-year undergraduate institution. These are considerable variations in the average productivities observed among the 75 institutions studied . . . (They) range from a low of 3.8 to a high of 11, with a mean of about 6.[40]

Dropouts raise the ratio and the later they leave the higher the index goes.[41] Transfers in at the upper division would give the appearance of an improved ratio. Fortunately for the simplicity of our data, the influence of students who completed the first two years at a community college before entering a state-owned college was small during the period covered by these data.

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[38] John C. Griffiths, "A Potential Measure of Performance for University Systems" (University Park, Pa., Vice-President, Office for Planning, The Pennsylvania State University, February 1970), p. 1.

[39] Seymour E. Harris, *A Statistical Portrait of Higher Education* (New York: McGraw-Hill, 1972), p. 346.

[40] Robbin R. Hough, "The Outputs of Undergraduate Education," *The Outputs of Higher Education* (Boulder, Col.: WICHE, 1970), pp. 93-104.

[41] David W. Breneman, "An Economic Theory of Ph.D. Production, The Case at Berkeley" (Paper P-8, Office of Vice President: Planning and Evaluations, University of California, June 1970), p. 5. This analyst emphasizes another aspect of the relationship between degree output and the preparatory stages. (In the present context, "efficiency" is defined as the ratio of degree output to the input of doctoral student time. Thus, a relatively 'inefficient' department would be marked by an excessively large average time to degree and/or a high rate of attrition, particularly if the attrition typically occurs after students have spent several years in the program.)

Corrections for Enrollment Change

The influence of changes in enrollment upon the ratio is too sharp to go uncorrected. Rapid rates of increase in the number of entering students would have the effect of raising the ratio. To dampen this influence—it cannot be wholly eliminated—a moving five year average of enrollment has been used as a base. Why five years rather than four? Studies have shown that the mean time for completion of the baccalaureate is about 4.7 years, with only half the students finishing in the prescribed time; thus the five-year period relates degrees to the most representative population.

A second correction has also been introduced to standardize degree otuput for the effects of enrollment. That share of degree output which is attributable to a rise or fall in enrollment is deducted or added before the ratio is calculated.

We can conclude, then, that the ratio of enrolled undergraduate students to degrees awarded, adjusted for perturbations in enrollment and corrected for the effects of enrollment change on degree output, is a good reflection of factors that act upon the student's educational experience. Comparisons among institutions over time by this method are reasonable and can be interpreted quite readily.

Sources

A note must be made on the source of the data. There is no single continuous official record of these data and, as is usual over a forty-six year span, definitions change. The reports of the Superintendent of Public Instruction were used for years 1930 to 1967 and the Secretary of Education's reports for recent years. Missing enrollments and degrees awarded were gathered directly from the registrars of the respective institutions and we are grateful for their prompt response. Definitions are troublesome in the early years but the totals represent certifications that are equivalent to four-year baccalaureate programs in years when the transition from diplomas to degrees occurred. The reporting base for enrollment shifted from spring to fall in the mid-fifties. To increase continuity, estimated data were introduced to cover the seventeen-month gap that resulted.

Summary of Data

The Unique Decade

Growth in college enrollments during the 1960s was so large and so rapid that it exceeded every historical precedent. With equal certainty, it can be said that the conditions will never be duplicated. A confluence of social forces acted to raise these peaks: high birth rates from war-delayed and depression-postponed marriages, increased high school completion rates, economic optimism, and strong tides of social aspiration. Not only is it unlikely that these factors will appear together again, but a new set of preferential stays on fertility have emerged in the form of birth control practices and public concern with overpopulation. However, a substantial 55 percent increase in bachelor's degrees is anticipated for the 1970-1981 period on the national scene. Pennsylvania projections show an increase in baccalaureates from 47,321 to 69,400.[42]

A look at some of the effects of the past decade will give a better perspective for planning. The events of the 1960s produced a new order of relationships in the Commonwealth and the main outlines are described by the following information on enrollments, degrees, the ratio between them, and doctoral origins.

Enrollments (Figures 1 and 2)

Enrollments at the undergraduate level for Pennsylvania can be viewed according to size or rates of change. Over the long span from 1925 to the latest year of record, 1971, the size of enrollment at state-owned colleges increased 8.8 times from 6,851 to 60,499 (Table 1). In the latest ten-year period, 1961-71, state-owned institutions increased by a factor of 2.6. All Pennsylvania undergraduate enrollments in the same decade grew from 127,505 to 274,476, a factor of 2.2. For the United States as a whole, the growth factor was 1.9. State-owned institutions enrolled an increasing share of the undergraduate students rising from 18 percent to 21 percent over the decade.

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[42] National data are drawn from: K. A. Simon and M. M. Frankel, *Projections of Educational Statistics to 1980-81* (Washington, D.C., National Center for Educational Statistics, Office of Education, 1972). State data from: R. G. Hummel, et al., *Projections, Selected Educational Statistics for Pennsylvania* (Harrisburg, Pennsylvania, Pennsylvania Department of Education, 1972).

Among the state-owned institutions, the greatest growth occurred at Edinboro, Slippery Rock, and Mansfield, in that order, while smallest increases (Figure 1) appeared at East Stroudsburg, Lock Haven, and California. The annual rates of change for these institutions also display some interesting differences (Table 5, Figure 4). Most marked has been the high rates of growth at Indiana University and Edinboro, two institutions that moved into branch campuses in the early sixties along with Clarion. The traditional leadership of West Chester passed to the new Indiana University in 1955. Throughout, Cheyney has had slow development compared to the other colleges in the group. All have moved at a rapid rate since 1965 and only in 1971 was there a perceptible downturn in enrollments (Table 5).

Undoubtedly, this pattern of growth reflects acts of public policy rather than simple demographic pressure. High school graduations alone do not account for it. They took a substantial jump in 1965 but then dropped back to a lower level for three successive years. It was the broader range of academic offerings, construction of new facilities, new funding levels, and student aid provided by PHEAA or federal sources that made it possible for citizens of the Commonwealth to enroll in these institutions of higher learning.

Degrees (Figure 3)

Inevitably the pattern of degree output for the state-owned institutions is quite similar to enrollment. Actually, the increase in baccalaureate degrees was slightly larger, showing a factor of 2.7 (enrollment 2.6) [Table 3]. These institutions also gained a slightly larger share of the total for Pennsylvania, too, with baccalaureates awarded increasing from 18 percent in 1962 to 25 percent in 1971. It would be helpful to have coherent data on degree fields, but such information is available only in fragments. One of these fragments displays an intriguing condition. In 1961-62, the state-owned colleges provided 51 percent of the initial teacher certifications.[43] Despite the new name of "State Colleges" and the conscious effort to add liberal arts or professional majors, these institutions provided even more (54 percent) of the teacher certifications in 1970-71. This is not to say that the change in mission (Table 7) for these institutions has had no effect or an adverse one. Among the graduates of the state-owned institutions, a decreasing share have actually been entering education, a drop from 60 percent to 55 percent between 1961-62 and 1970-71. However, this is a small change and clearly demonstrates that the roots of major innovation lie deep within institutions rather than with name changes or a few new programs.

Ratio of Enrollment to Degrees (Figure 5)

We have already noted the value of this index as an indicator of "efficiency" or of "success rate." It is a qualitative indicator that tells something of how the system is working when compared to an "ideal." The state-owned institutions have made good progress over the years, particularly since 1960 as the ratio dropped from 5.0 to 4.5 (Table 6). They have reached the point where further improvements in degree output will be small and made only by careful policy decisions. The direction of further improvement in this degree ratio below the excellent level of 4.5 lies with careful articulation with community and junior colleges. The existence of these two-year institutions helps in two ways. They offer options to students who are uncertain or unready for four-year programs. They produce candidates proven by two years of study for admission at the junior level. Both these elements should reduce dropouts and delays thereby improving the degree ratio of four-year institutions even further.

The quality of the State College performance comes through strongly in comparison with Pennsylvania institutions. In a fairly typical year, 1968-69, the national ratio was 6.4; the state ratio 5.5; and the state-owned group 4.5. The full range of data show that our subject institutions have improved themselves steadily over the years to the point where the present performance is excellent.

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[43] Hummel, et al., *Projections,* Table 10.

Baccalaureate Origins of Doctoral Recipients (Figure 6)

An indication of the position of an undergraduate institution in this mainstream of American education is the number of baccalaureates who go on to complete their doctorates. Initial studies of this relationship by Knapp, Goodrich, and Greenbaum, elaborated in subsequent work and refined by Astin and Panos, showed that certain undergraduate schools had remarkable success in producing students who went on to complete advanced degrees.[44]

Over the years, the National Research Council, acting for the National Academy of Sciences and the National Academy of Engineering, has collected information about each new crop of doctorates. One piece of information is the institution at which they received their first degree. By special arrangement, the Center for the Study of Higher Education at The Pennsylvania State Univeristy obtained the data on doctorates for all the state-owned colleges and for a representative group of private colleges in the state. The number of doctorates in all fields and the percent of that number in education is displayed in Table 8. To give a clearer picture of growth rates, the total number of doctorates who had their baccalaureate preparations in the fourteen state-owned institutions is plotted on a semi-logarithmic graph (Figure 6).

The state-owned institutions were not an important or even significant source of doctorates until recently—since 1965. It is more than coincidence that the upward trend began when the first classes educated under the State College rubric graduated. Growth rates have been rapid, but a leveling effect can be anticipated as doctoral support falls off. Among the state-owned institutions, there are large differences between Cheyney, Clarion, and Mansfield, among the lower contributors to the doctoral pool, and there is no clear correlation with enrollment level even though Indiana and West Chester stand at the top of the list. Obviously, the relationship between undergraduates and subsequent doctoral study is complex or individualized to the point where only detailed study can give definitive answers. As the programs offered by our subject institutions expand, this index of doctoral origins may prove to be a useful measure of progress.

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[44] R. H. Knapp and H. B. Goodrich, *Origins of American Scientists* (Chicago, 1952); R. H. Knapp and Joseph Greenbaum, *The Younger American Scholar: His Collegiate Origins* (Middletown, Connecticut, 1953); R. H. Knapp, *The Origin of American Humanistic Scholars* (Englewood Cliffs, New Jersey, 1964); A. W. Astin, "'Productivity' of Undergraduate Institutions," *Science*, April 13, 1962, pp. 129-135.

Summary and Conclusions

Findings

1. Enrollment at the undergraduate level in the state-owned institutions has increased almost nine times since 1925 and by 2.6 times in the 1960s.
2. The rate of enrollment increase for these institutions has been greater than the average growth rate for U.S. or Pennsylvania and they now enroll 21 percent of the undergraduates in the Commonwealth compared to 18 percent ten years ago.
3. Degree output at the baccalaureate level for the state-owned institutions has increased slightly faster than enrollment and they award 25 percent of these degrees granted by institutions within the Commonwealth.
4. The change to a State College status has had little effect on the share of teacher certifications in the state provided by state-owned institutions. Now at about 54 percent, it is up from 51 percent ten years ago. These are indications that fewer of those prepared for teaching now enter the profession. This signifies that teacher preparation is serving as general education rather than for its intended purpose.
5. The ratio of enrollment to degrees has improved steadily in the state-owned institutions to a low of 4.5 in 1971. This reflects a good level of efficiency that is substantially better than the all-state level of 5.5, and much better than the national level of 6.5.
6. Graduates of state-owned institutions have appeared on the Survey of Current Doctorates only recently in significant numbers but the number of students completing advanced study has increased rapidly.

Throughout their first century, the destiny of the state-owned colleges in Pennsylvania was bound into the development of the public schools. The growth of the collegiate institutions reflects the long, steady parallel rise in the school population and the educational level of the nation. Most recent effects on the colleges have come from the expansion of secondary education, largely since 1920. This growth brought new qualitative changes in teacher preparation as the colleges responded to increasing scientific and technical sophistication, to needs for special education and guidance, and to the rapid pace of social change. Basically, the State Colleges have served their designed purpose of increasing the professional competence of personnel in the public schools.

In the last fifteen years, another social force has acted upon these state-owned institutions. The democratization of opportunity for higher education has resulted in exceptional growth in public institutions. The idea was consistent with their tradition. Jencks and Riesman noted that throughout the U.S. these colleges have been a valuable avenue of education for women at times when other segments of higher education presented limitations of curriculum and career options.[45] For other groups as well, they have afforded a good basic general education and the share of teacher-trained graduates entering other fields has increased reaching more than 35 percent in recent years.[46] This means, of course, that these institutions have become a significant source of trained personnel for the larger business and professional world. By their location, they have also offered accessible opportunity in areas of the Commonwealth not conveniently served by other types of colleges and universities. Lower fees at these institutions have encouraged students who might not have considered college study and, what is more, they have done so without the elaborate administration required by extensive institutional financial aid programs. More open policies of admission have further extended opportunity to those with modest or less consistent academic records.

These colleges have done well in responding to societal mandates. The measures used here—degrees, enrollment, and the ratio between them—are few but they are significant educational indicators of that response. The state-owned institutions increased their enrollments as rapidly as public policy would allow. They improved their "efficiency" steadily throughout the recent decades and they continued their role in teacher training throughout the years of shortage. Still, there is another aspect of this history. The State Colleges have been much affected by the societal climate. Economic depressions and downturns, wars and the return from wars, have had drastic effects on enrollment.

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[45] C. Jencks and D. Riesman, *The Academic Revolution* (Garden City, New Jersey: Doubleday, 1968), p. 231.

[46] Pennsylvania Department of Education, *Calculator* 12 (August 1971). Summary of NEA Teacher Supply and Demand Study.

The Future

The features which are clear in retrospect fade rapidly as one turns toward the future. A primary motivating force, the rapid rise in school age population and the extension of public school opportunities to an increasing share of that population, is now history. The great public school movement, a century-long trend, has ended its rapid growth. The impact of new student cohorts of ever increasing size is past and, although postsecondary enrollments will grow, their effects will be shared by a wider range of institutions, notably the vo-tech schools and two-year colleges.[47]

A new role for the state-owned institutions has been forming for a dozen years, partly in answer to these changes, partly in response to local demand for new skills and knowledge in business, public administration, health, and human services. A limited number of new programs has been developed at these institutions largely through the initiative of administrative leadership at individual colleges. Programs have had to be built up from the resources at hand, stretching faculty competence, using facilities on a makeshift basis, and tying in with usable community facilities wehre possible. Formal acknowledgement of these new social needs has been slow, as the wording of the Master Plan of 1971 demonstrates. In the absence of formal acknowledgement, particularly in the form of stated public policy and comprehensive public planning, these institutions cannot hope to undertake the full range of alterations required to meet the educational demands of the next two decades. Those changes for which full public acknowledgement are needed include: faculty development programs to create new areas of competence within existing faculty structures, organizational innovations that will provide efficient administration for new programs, modification of facilities and equipment to support advanced preparation in specialized areas, and new avenues of liaison with the college or university service area.

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[47] Frank M. Durkee, "Teacher Manpower Demand and Supply for Elementary and Secondary Schools in Pennsylvania," mimeographed (Harrisburg, Pennsylvania: Pennsylvania Department of Education, September, 1971).

The engine of growth lies now in the knowledge-based character of our society. Pressure for more education will come more and more from new bands in the occupational-professional spectrum. For the individual, one phase—his education and his reeducation—will be related to employability, even though there will be other reasons, as there have always been, for higher education. Clearly, the state-owned institutions must move rapidly toward training for a wider range of occupational-professional competence. In their present configuration, these institutions are limited to teacher education, general liberal arts, and whatever other programs ingenuity can construct. Such a policy of containment, if pursued literally, will inevitably result in large numbers of unemployable college graduates. Teacher demand is limited: general education has become, since 1969, insufficient.[48] And the specialized programs now operating cannot achieve full value without careful cultivation.[49]

Summary

Enrollment at the state-owned institutions has increased more rapidly than the state or national average for the period 1961-1971. The degree output at the baccalaureate level has grown even more rapidly. Taken together as a ratio, these two indicators demonstrate a substantial increase in efficiency for these institutions that exceeds national and state averages. While they have made progress in preparing those who later complete the doctorate, their contribution is not yet large when compared to the traditional liberal arts colleges. Clearly the state-owned colleges have steadily improved their efficiency and their contribution to the educational resources of the Commonwealth.

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[48] Ivan Berg, *Education and Jobs: The Great Training Robbery* (New York: Praeger, 1970).

[49] None of these issues is peculiar to Pennsylvania, but other states, notably New York, have moved to meet them. See G. Lester Anderson's "The University's Colleges and Occupational-Professional Education," mimeographed (Office of the Provost, State University of New York, July 1970).

Their historical role has been rooted in the expansion of the public school and democratization, two long-term trends now approaching stability. Current and future demands of society are rooted in the knowledge-based quality of occupational-professional practice. The link between the established competence of these institutions and the changing economic demand lies in new formulations of public policy which recognize a changed mission and new planning designs which develop long-range support.

LIST OF TABLES

TABLE 1. Enrollments, Full-Time Undergraduate, State-Owned Institutions of Pennsylvania (1925 to 1971).

TABLE 2. Full-Time Undergraduate Enrollments at State Colleges of Pennsylvania (1925–1929 to 1966–1970).

TABLE 3. Bachelors' Degrees Awarded at State Colleges of Pennsylvania: for Academic Years Commencing Designated Years 1929-30 to 1970–71.

TABLE 4. Undergraduate Enrollments, Rates of Change: United States, Pennsylvania, and Pennsylvania State-Owned Institutions.

TABLE 5 Baccalaureate Degrees: Yearly Rates of Change: United States, Pennsylvania, and Pennsylvania State-Owned Institutions.

TABLE 6. Ratio of Enrollment to Degrees.

TABLE 7. Preparation of Teachers for Initial Certification in Pennsylvania.

TABLE 8. Doctoral Recipients in U.S. with Baccalaureates at Pennsylvania State-Owned Institutions & Ten Representative Private Colleges.

TABLE 9. Bachelors' Degrees Awarded in Pennsylvania by All Institutions and by State-Owned Institutions—(1961–62 to 1970–71).

LIST OF ILLUSTRATIONS

FIGURE 1. Undergraduate Enrollments, by Year, Pennsylvania State-Owned Institutions: 1925 to 1971 (in thousands).

FIGURE 2. Enrollment for Selected Pennsylvania State-Owned Institutions 1925–1971.

FIGURE 3. Bachelors' Degrees Awarded, by Year, Pennsylvania State-Owned Institutions: 1929 to 1971 (in thousands).

FIGURE 4. Annual Rate of Increase Undergraduate Enrollment.

FIGURE 5. Ratio of Enrollment to Degrees, by Year, Pennsylvania State-Owned Institutions: 1932 to 1970.

FIGURE 6. Doctorate Recipients in U.S. with Baccalaureates from Pennsylvania State-Owned Institutions and from Ten Representative Private Colleges: by Five Year Intervals, 1920-25 to 1966-70.

FIGURE 7. Undergraduate Enrollments in Pennsylvania by Class of Institution—1962 to 1971 (Semi-Log Scale).

TABLE 1
ENROLLMENTS, FULL-TIME UNDERGRADUATE, STATE-OWNED INSTITUTIONS OF PENNSYLVANIA
1925 TO 1971
ACTUAL ENROLLMENT BY INSTITUTION

Institution	1925	1926	1927	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940
Bloomsburg	606	715	752	739	712	686	668	681	642	601	580	622	713	673	700	681
California	401	600	655	624	676	847	773	741	673	666	657	745	761	641	712	733
Cheyney	66	83	101	134	139	159	154	189	172	160	150	156	157	150	188	203
Clarion	204	286	246	209	280	308	306	375	368	263	267	229	204	215	280	321
East Stroudsburg	557	695	796	856	796	763	762	778	716	609	579	555	580	536	517	550
Edinboro	492	588	644	591	621	628	609	570	535	439	319	302	312	266	314	290
Indiana	965	1151	1273	1356	1425	1554	1566	1517	1381	1273	1285	1360	1357	1215	1354	1440
Kutztown	351	459	436	459	579	477	494	541	531	435	456	489	505	477	506	500
Lock Haven	263	398	434	426	476	529	568	601	586	475	408	432	426	364	403	395
Mansfield	564	658	801	821	818	815	755	767	716	645	617	624	602	579	583	601
Millersville	387	533	519	551	526	497	534	599	581	523	573	534	535	536	531	505
Shippensburg	412	518	562	616	675	740	691	677	628	483	408	416	476	460	503	515
Slippery Rock	433	591	673	747	852	892	862	968	879	796	686	683	691	573	587	591
West Chester	1150	1101	1139	1225	1303	1389	1428	1404	1251	1183	1139	1234	1303	1387	1620	1622
TOTAL—ALL STATE COLLEGES	6851	8376	9031	9354	9878	10284	10170	10408	9659	8549	8124	8381	8622	8072	8798	9007

SOURCE: *Statistical Reports of the Superintendent of Public Instruction* for reporting periods 1930-1967; *Statistical Reports of the Secretary of Education* for reporting periods 1968-1971. [Except as indicated.]

TABLE 1 (cont.)

Institution	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955
Bloomsburg	599	421	294	313	207	341	747	780	869	894	857	800	795	744	882
California	631	490	379	189	197	418	676	1001	763	1220	737	825	668	656	876
Cheyney	216	218	156	142	144	212	330	374	384	396	415	348	389	410	510
Clarion	325	267	236	146	153	261	650	665	740	764	732	587	506	454	578
East Stroudsburg	509	468	363	212	267	503	802	891	971	1004	944	782	765	763	910
Edinboro	274	217	197	116	124	170	508	505	561	590	578	452	407	384	461
Indiana	1448	1281	1205	782	733	988	1413	1522	1549	1650	1620	1562	1580	1587	1732
Kutztown	470	393	309	249	262	383	607	692	821	897	950	843	781	736	818
Lock Haven	430	341	265	173	202	361	704	726	646	686	619	488	524	543	648
Mansfield	554	474	388	240	198	298	650	700	790	768	717	581	571	555	573
Millersville	550	480	339	197	196	380	625	758	767	825	803	705	694	727	896
Shippensburg	491	397	293	177	192	332	703	754	745	792	763	676	635	629	741
Slippery Rock	572	455	358	204	207	430	641	765	849	914	903	796	800	795	865
West Chester	1586	1413	1202	808	834	1251	1760	1827	1806	1840	1769	1649	1718	1749	1850
TOTAL—ALL STATE COLLEGES	8655	7315	5978	3948	3916	6328	10816	11960	12231	13260	12457	11094	10833	10732	12340

TABLE 1 (cont.)

Institution	a/ F1955	F1956	F1957	F1958	F1959	F1960	F1961	F1962	F1963	b/ F1964	c/ F1965	F1966	F1967	F1968	F1969	F1970	F1971
Bloomsburg	958	1078	1187	1472	1675	1737	1932	1971	2167	2335	2848	3083	3197	3397	3550	3954	4239
California	955	1096	1192	1632	2563	2205	2667	2746	2958	3239	3811	4002	4203	4536	5097	5098	4931
Cheyney	513	562	569	725	794	833	879	911	996	1216	1509	1621	1788	1933	1856	1835	2184
Clarion	621	688	764	996	1099	1346	1750	2133	2484	2316	2795	2874	3030	3206	3432	3463	3697
East Stroudsburg	948	1023	1095	1269	1269	1415	1587	1721	1740	1818	1993	2046	2145	2174	2397	2824	2911
Edinboro	623	769	876	1140	1147	1413	1725	1991	2195	2468	3072	3758	4270	5208	5839	5615	5922
Indiana	1974	2193	2382	3001	3112	3087	3442	3872	4321	4301	5181	6063	6992	7561	8592	8866	8763
Kutztown	859	921	959	1248	1620	1470	1730	1796	1998	2464	2676	2914	3240	3557	3966	4097	3901
Lock Haven	692	782	793	969	1110	1073	1253	1358	1400	1538	1622	1776	1961	2147	2314	2375	2324
Mansfield	624	685	681	917	988	1011	1147	1225	1357	1643	1903	2101	2479	2565	2806	2993	3014
Millersville	1052	1218	1368	1535	1658	1751	1892	2046	2253	2505	2893	3107	3282	3684	3876	4174	4225
Shippensburg	893	1066	1137	1259	1316	1317	1447	1616	1832	2187	2640	2951	3097	3515	3711	3711	3906
Slippery Rock	899	901	1033	1278	1339	1314	1505	1709	1996	2296	2783	3217	3566	3902	4046	4422	4846
West Chester	1849	1887	1910	2052	2051	2382	2651	2863	3245	3533	3998	4316	4766	5430	5807	5863	5636
TOTAL–ALL STATE COLLEGES	13460	14869	15946	19493	21741	22424	25632	27958	30942	33861	39724	43829	48016	52815	57289	59290	60499

All years preceded by an "F" indicate Fall enrollments.

[a] Reporting base shifted from Spring 1955 to Fall 1956 in the academic year 1955-56. To provide continuity, estimates have been made of the enrollments for that missing year.

[b] Enrollment data for Fall 1964 entitled "Students of College Grade–On Campus" in *Statistical Report* for that year.

[c] Enrollment data for Fall 1965 includes graduates and undergraduates; no separate totals reported.

TABLE 2
FULL-TIME UNDERGRADUATE ENROLLMENTS AT STATE COLLEGES OF PENNSYLVANIA
(1925-1929) TO (1966-1970)
FIVE YEAR MOVING AVERAGES TO DESIGNATED YEAR

Institution	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	1941
Bloomsburg	705	721	711	697	678	656	634	623	632	646	666	686	681
California	591	639	663	680	690	688	650	644	648	642	651	666	644
Cheyney	105	123	137	155	163	165	163	163	157	153	158	169	181
Clarion	245	266	270	282	327	324	316	300	266	236	239	250	269
East Stroudsburg	740	781	796	791	763	726	689	647	608	572	553	548	538
Edinboro	587	614	619	604	593	556	494	433	381	328	303	297	291
Indiana	1234	1352	1435	1484	1489	1458	1404	1363	1331	1326	1342	1345	1363
Kutztown	457	482	489	510	524	496	491	490	483	472	487	495	492
Lock Haven	399	453	487	520	552	552	528	500	466	421	407	404	404
Mansfield	732	783	802	795	774	734	694	668	635	608	595	592	578
Millersville	503	525	525	541	547	545	560	560	548	539	540	546	550
Shippensburg	557	622	657	680	682	644	577	522	482	449	453	474	489
Slippery Rock	659	751	805	864	891	879	838	802	747	686	644	625	603
West Chester	1184	1231	1297	1350	1355	1331	1281	1242	1222	1249	1337	1433	1504
TOTAL–ALL STATE COLLEGES	8698	9385	9743	10019	10080	9814	9382	9024	8667	8350	8399	8576	8631

SOURCE: Dervied from Table 1 by averaging actual enrollments for five-year period up to and including each designated year.

TABLE 2 (cont.)

Institution	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Bloomsburg	615	539	462	367	315	380	478	589	726	829
California	589	537	432	325	283	372	496	611	816	879
Cheyney	193	194	185	173	172	195	238	286	337	378
Clarion	282	286	259	225	213	289	375	494	610	704
East Stroudsburg	516	481	420	364	363	429	535	687	834	890
Edinboro	272	258	219	186	165	223	285	374	467	548
Indiana	1348	1346	1231	1090	998	1024	1088	1241	1424	1551
Kutztown	469	436	384	337	319	362	439	553	680	793
Lock Haven	387	367	321	282	269	341	433	528	625	676
Mansfield	558	520	451	371	320	355	417	527	641	725
Millersville	539	499	426	352	332	390	473	583	671	756
Shippensburg	473	440	375	310	278	339	432	545	665	751
Slippery Rock	556	513	436	359	331	368	449	578	720	814
West Chester	1526	1489	1326	1169	1102	1171	1296	1496	1697	1800
TOTAL—ALL STATE COLLEGES	8369	8218	7248	6230	5764	6465	7661	9318	10920	12163

TABLE 2 (cont.)

Institution	1952	1953	1954	1955	F1955	F1956	F1957	F1958	F1959	F1960	F1961	F1962
Bloomsburg	840	843	818	816	836	891	970	1115	1274	1430	1601	1757
California	909	843	821	752	796	850	936	1131	1468	1738	2052	2363
Cheyney	381	384	387	406	434	477	513	576	633	697	760	828
Clarion	691	659	602	565	549	569	621	729	834	979	1176	1450
East Stroudsburg	886	861	819	800	835	883	949	1050	1121	1214	1327	1452
Edinboro	537	518	482	456	465	529	623	724	861	1019	1210	1433
Indiana	1581	1592	1600	1616	1687	1813	1974	2256	2532	2755	3005	3303
Kutztown	841	858	841	826	807	823	859	961	1121	1244	1405	1573
Lock Haven	633	593	572	564	579	638	692	742	834	910	1004	1117
Mansfield	711	685	638	599	581	602	624	696	779	856	949	1058
Millersville	772	759	751	765	815	917	1052	1214	1366	1506	1641	1776
Shippensburg	746	759	699	689	715	793	893	1019	1134	1219	1295	1391
Slippery Rock	846	853	842	833	831	852	899	995	1090	1173	1294	1429
West Chester	1778	1756	1745	1747	1764	1812	1850	1911	1951	2057	2206	2396
TOTAL–ALL STATE COLLEGES	12200	11975	11675	11491	11692	12447	13469	15222	17102	18895	21047	23450

TABLE 2 (cont.)

Institution	F1963	F1964	F1965	F1966	F1967	F1968	F1969	F1970
Bloomsburg	1896	2028	2251	2481	2726	2972	3215	3389
California	2628	2763	3084	3351	3643	3958	4330	4587
Cheyney	883	967	1102	1251	1426	1613	1741	1807
Clarion	1747	1991	2280	2505	2685	2829	3052	3186
East Stroudsburg	1546	1656	1772	1864	1948	2030	2146	2312
Edinboro	1644	1908	2240	2647	3103	3755	4429	4938
Indiana	3567	3805	4223	4748	5372	6020	6878	7615
Kutztown	1723	1892	2133	2370	2659	2971	3272	3556
Lock Haven	1204	1289	1399	1504	1624	1774	1929	2079
Mansfield	1146	1277	1455	1646	1897	2138	2371	2589
Millersville	1920	2089	2318	2561	2808	3094	3368	3625
Shippensburg	1506	1680	1944	2245	2541	2878	3183	3397
Slippery Rock	1573	1764	2058	2401	2772	3153	3503	3831
West Chester	2635	2931	3254	3587	3968	4405	4860	5233
TOTAL–ALL STATE COLLEGES	25739	28163	31623	35262	39274	43649	48335	52248

TABLE 3
BACHELORS' DEGREES AWARDED AT STATE COLLEGES OF PENNSYLVANIA: FOR ACADEMIC YEARS COMMENCING DESIGNATED YEARS
1929-30 TO 1970-71

Institution	a/ 1929	a/ 1930	a/ 1931	a/ 1932	a/ 1933	a/ 1934	a/ 1935	a/ 1936	1937	1938	1939	1940	1941
Bloomsburg	47	46	48	84	106	107	91	96	141	122	146	152	137
California	23	40	68	111	126	96	124	129	99	113	173	136	151
Cheyney	N/D	N/D	4	8	20	17	27	27	40	34	28	27	35
Clarion	10	13	25	33	29	39	35	20	35	35	41	55	94
East Stroudsburg	62	82	107	118	131	136	100	88	121	93	121	93	148
Edinboro	46	76	91	81	89	70	66	36	48	73	69	81	73
Indiana	102	116	163	172	176	218	194	201	196	210	273	305	326
Kutztown	28	38	30	87	95	92	80	67	92	143	152	145	137
Lock Haven	22	43	39	42	77	63	56	43	58	83	83	91	89
Mansfield	128	144	121	127	107	119	124	82	118	119	135	122	127
Millersville	27	50	61	74	117	126	112	108	123	110	148	143	156
Shippensburg	54	70	69	91	81	100	78	77	77	98	123	129	109
Slippery Rock	67	70	90	84	120	136	97	88	93	120	108	129	134
West Chester	103	136	166	191	219	233	216	219	225	328	321	384	369
TOTAL—ALL STATE COLLEGES	719	924	1082	1303	1493	1552	1400	1281	1466	1681	1921	1982	2085

SOURCE: *Statistical Reports of the Superintendent of Public Instruction* for reporting periods 1930-1967; *Statistical Reports of the Secretary of Education* for reporting periods 1968-1971. [Except as indicated.]

TABLE 3 (cont.)

Institution	1942	1943	1944	1945	1946	1947	1948	1949	1950	1951
Bloomsburg	113	71	75	50	86	104	158	275	219	171
California	165	102	80	106	123	126	195	238	208	145
Cheyney	38	30	39	22	33	36	61	90	64	62
Clarion	66	62	54	46	59	75	107	177	166	163
East Stroudsburg	109	61	59	63	120	140	222	221	216	195
Edinboro	70	58	53	39	56	74	111	114	132	135
Indiana	285	256	187	218	212	217	336	420	370	349
Kutztown	109	85	76	83	92	114	172	231	219	214
Lock Haven	80	52	42	44	91	89	149	217	163	109
Mansfield	120	124	51	43	81	78	127	214	197	153
Millersville	114	75	57	57	85	117	169	205	209	175
Shippensburg	109	62	59	62	78	92	126	216	199	137
Slippery Rock	144	102	65	63	86	113	169	222	196	185
West Chester	369	245	230	187	256	287	468	493	368	356
TOTAL—ALL STATE COLLEGES	1891	1385	1127	1083	1458	1662	2570	3333	2926	2549

TABLE 3 (cont.)

Institution	b/ 1952	b/ 1953	b/ 1954	b/ 1955	b/ 1956	b/ 1957	1958	1959	b/ 1960	b/ 1961	b/ 1962
Bloomsburg	208	198	154	173	188	245	322	321	297	384	404
California	207	161	132	167	229	283	338	332	426	518	558
Cheyney	62	72	30	77	75	86	122	136	136	143	164
Clarion	130	108	85	120	138	267	165	165	215	265	313
East Stroudsburg	192	175	136	159	185	267	270	268	220	256	283
Edinboro	117	96	81	110	126	147	204	218	201	255	260
Indiana	390	323	315	361	400	474	544	625	644	705	691
Kutztown	232	179	187	147	202	233	239	230	284	304	316
Lock Haven	114	108	83	117	153	154	198	169	217	214	261
Mansfield	156	131	103	114	141	151	176	152	159	209	216
Millersville	165	170	159	160	195	261	359	355	357	337	385
Shippensburg	163	141	140	162	209	265	N/D	297	282	284	341
Slippery Rock	187	184	154	172	177	218	227	216	271	332	310
West Chester	432	388	353	449	430	449	452	452	468	531	582
TOTAL–ALL STATE COLLEGES	2755	2434	2112	2488	2848	3500	3616	3936	4177	4737	5084

NOTES: [a]Graduates with "certificates of graduation in four year curriculums (sic)" are assumed to be equivalent to baccalaureate recipients.

[b]Degree data for these years supplied directly by registrars of respective institutions.

TABLE 3 (cont.)

Institution	b/ 1963	1964	1965	1966	1967	1968	1969	1970
Bloomsburg	474	481	484	545	712	745	783	790
California	735	739	674	792	924	1084	1169	1239
Cheyney	155	216	190	210	278	343	327	293
Clarion	427	495	560	559	519	793	704	776
East Stroudsburg	359	333	367	344	404	487	552	519
Edinboro	374	433	476	437	596	800	968	1003
Indiana	876	916	958	993	1217	1428	1710	1796
Kutztown	410	450	403	459	650	658	687	817
Lock Haven	252	278	294	280	344	403	490	496
Mansfield	261	294	299	331	484	520	549	686
Millersville	448	514	527	550	710	901	913	987
Shippensburg	378	411	414	463	614	800	842	820
Slippery Rock	353	407	433	507	589	798	635	1006
West Chester	662	633	658	829	895	1040	1163	1362
TOTAL–ALL STATE COLLEGES	6164	6600	6737	7299	8936	10800	11492	12590

TABLE 4
UNDERGRADUATE ENROLLMENTS, RATES OF CHANGE: UNITED STATES, PENNSYLVANIA, AND PENNSYLVANIA STATE-OWNED INSTITUTIONS

	All US. Institutions		All Penna. Institutions		Penna. State-Owned Institutions	
	Number	% Change	Number	% Change	Number	% Change
1971-72			378,760	(5.0%)	61,583	
1970-71	6,648,000	(4.6%)	360,634	(4.0%)	60,499	(2.0%)
1969-70	6,290,167	(3.8%)	346,279	(7.0%)	59,290	(4.0%)
1968-69	5,955,644	(4.7%)	324,975	(6.0%)	57,289	(8.0%)
1967-68	5,638,616	(5.9%)	307,439	(6.0%)	52,815	(10.0%)
1966-67	5,325,000	(6.8%)	288,522		48,016	(10.0%)
1965-66	4,984,000	(6.4%)			43,829	(10.0%)
1964-65	4,684,888	(10.5%)			39,724	(17.0%)
1963-64	4,239,305	(9.6%)			33,861	(9.0%)
1962-63	3,869,837	(7.9%)			30,942	(10.0%)
1961-62	3,585,407	(7.3%)			27,958	(9.0%)
1960-61	3,342,718	(6.8%)			25,632	(14.0%)
1959-60	3,131,393	(5.5%)			22,424	(3.0%)
1958-59	2,967,558	(13.2%)			21,741	(12.0%)
1957-58	2,621,919				19,493	(22.0%)

TABLE 5
BACCALAUREATE DEGREES: YEARLY RATES OF CHANGE: UNITED STATES, PENNSYLVANIA, AND PENNSYLVANIA STATE-OWNED INSTITUTIONS

	All U.S. Institutions		All Penna. Institutions		Penna. State-Owned Institutions	
	Number	% Change	Number	% Change	Number	% Change
1971-72			51,800	(3.5%)	13,400	(6.0%)
1970-71	865,000	(4.6%)	50,068	(5.8%)	12,590	(10.0%)
1969-70	827,234	(8.3%)	47,321	(4.7%)	11,492	(10.0%)
1968-69	764,185	(14.6%)	45,218	(16.2%)	10,800	(21.0%)
1967-68	666,710	(14.3%)	38,905	(15.5%)	8,936	(22.0%)
1966-67	583,100	(5.8%)	33,689	(6.8%)	7,299	(8.0%)
1965-66	551,040	(3.0%)	31,541	(1.7%)	6,737	(2.0%)
1964-65	535,031	(7.3%)	31,002	(2.2%)	6,600	(7.0%)
1963-64	498,654	(11.4%)	30,329	(13.9%)	6,164	(21.0%)
1962-63	447,622	(7.1%)	26,630	(6.1%)	5,084	(7.0%)
1961-62	417,846	(4.8%)	25,085		4,737	(13.0%)
1960-61	398,710	(1.6%)			4,177	(6.0%)
1959-60	392,440	(2.5%)			3,936	(9.0%)
1958-59	382,904	(8.2%)			3,616	(3.0%)
1957-58	362,554	(7.4%)			3,500	

TABLE 6
RATIO OF ENROLLMENT TO DEGREES

	U.S. Institutions	Penna. Institutions	Penna. State-Owned Institutions
1970-71	7.7	5.5	4.5
1969-70	7.6	5.6	4.7
1968-69	6.4	5.5	4.5
1967-68	6.8	5.8	4.9
1966-67	7.4	6.4	5.5
1965-66	7.4	6.6	5.3
1964-65	7.0		4.7
1963-64	6.8		4.6
1962-63	7.1		5.2
1961-62	7.1		5.0
1960-61	7.0		5.0
1959-60	6.7		5.0
1958-59	6.6		4.8
1957-58	6.6		4.2

TABLE 7
PREPARATION OF TEACHERS FOR INITIAL CERTIFICATION IN PENNSYLVANIA

	Total Certifications	State-Owned	State-Owned as % of Total
1961-62	9,434	4,826	(51.2)
1962-63	10,256	5,268	(51.4)
1963-64	11,625	6,157	(53.0)
1964-65	11,912	6,507	(54.6)
1965-66	12,354	6,533	(52.9)
1966-67	12,954	6,778	(52.3)
1967-68	15,191	8,812	(53.9)
1968-69	17,228	9,641	(56.0)
1969-70	18,182	10,148	(55.8)
1970-71	19,172	10,373	(54.1)

TABLE 8

DOCTORAL RECIPIENTS IN U.S. WITH BACCALAUREATES AT PENNA. STATE-OWNED INSTITUTIONS & TEN REPRESENTATIVE PRIVATE COLLEGES

	1920-1925	1926-1930	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961-1965	1966-1970	Total
State-Owned Institutions											
Bloomsburg					2	4	14	7	29	49	105
California					4	10	22	19	31	42	128
Cheyney						1	2	1	0	2	6
Clarion					2	3	6	6	12	47	76
E. Stroudsburg				1	4	4	12	13	14	38	86
Edinboro		1			2	6	15	8	21	33	86
Indiana				1	1	9	38	29	43	115	236
Kutztown			1		1	1	9	24	23	46	105
Lock Haven				1	1	4	13	13	18	34	84
Mansfield			1	1	3	3	10	12	9	24	63
Millersville					2	8	19	13	26	56	124
Shippensburg				2	3	6	17	12	23	56	119
Slippery Rock				5	2	8	16	16	32	53	132
West Chester		–	–	1	4	12	29	32	45	71	194
Total =		1	2	12	31	79	192	205	326	666	1,544

TABLE 8 (cont.)

	1920-1925	1926-1930	1931-1935	1936-1940	1941-1945	1946-1950	1951-1955	1956-1960	1961-1965	1966-1970	Total
Ten Private Colleges											
Allegheny	13	16	25	26	28	30	49	38	71	78	374
Dickinson	8	15	22	33	18	22	28	30	31	65	272
Elizabethtown			1	7	2	8	14	12	13	22	79
F & M	14	23	33	39	25	42	75	58	81	141	531
Gettysburg	17	17	13	18	20	24	28	40	43	110	330
Grove City	5	5	6	13	17	16	22	15	31	42	172
Lycoming	1		1				1	5	12	25	45
Susquehanna	2	3	10	7	6	6	11	15	10	22	92
W & J	2	10	8	23	13	24	32	22	29	65	228
Muhlenburg	8	13	16	11	15	21	39	33	45	83	284
Total =	70	102	135	177	144	193	299	268	366	653	2,407

SOURCE: NAS-NRC Doctoral Record File

TABLE 9

BACHELORS' DEGREES AWARDED IN PENNSYLVANIA BY ALL INSTITUTIONS AND BY STATE-OWNED INSTITUTIONS

(1961-62 TO 1970-71)

	Total	State-Owned	State-Owned as % of Total
1961-62	25,085	4,793	(19.1)
1962-63	26,630	5,001	(18.8)
1963-64	30,329	6,140	(20.2)
1964-65	31,002	6,600	(21.3)
1965-66	31,541	6,737	(21.4)
1966-67	33,689	7,299	(21.7)
1967-68	38,905	8,936	(23.0)
1968-69	45,218	10,800	(23.9)
1969-70	47,321	11,492	(24.3)
1970-71	50,068	12,590	(25.2)

Source: Hummel et al., *Projection 1972.*

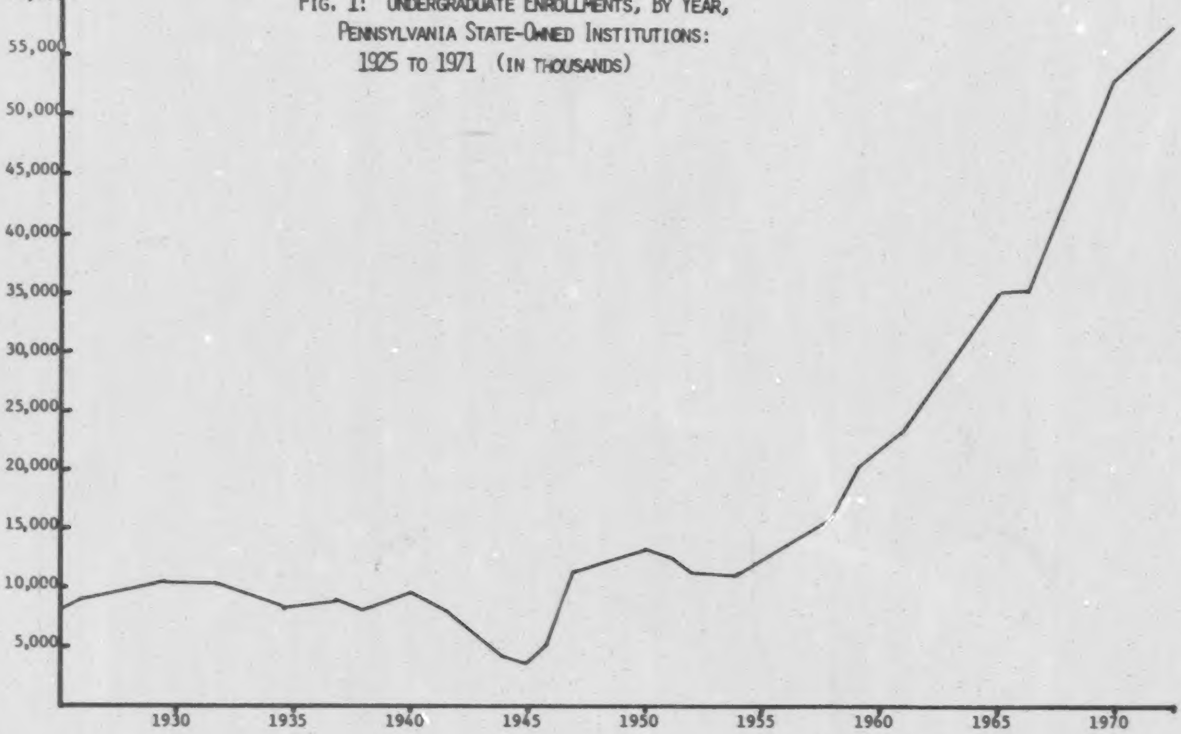
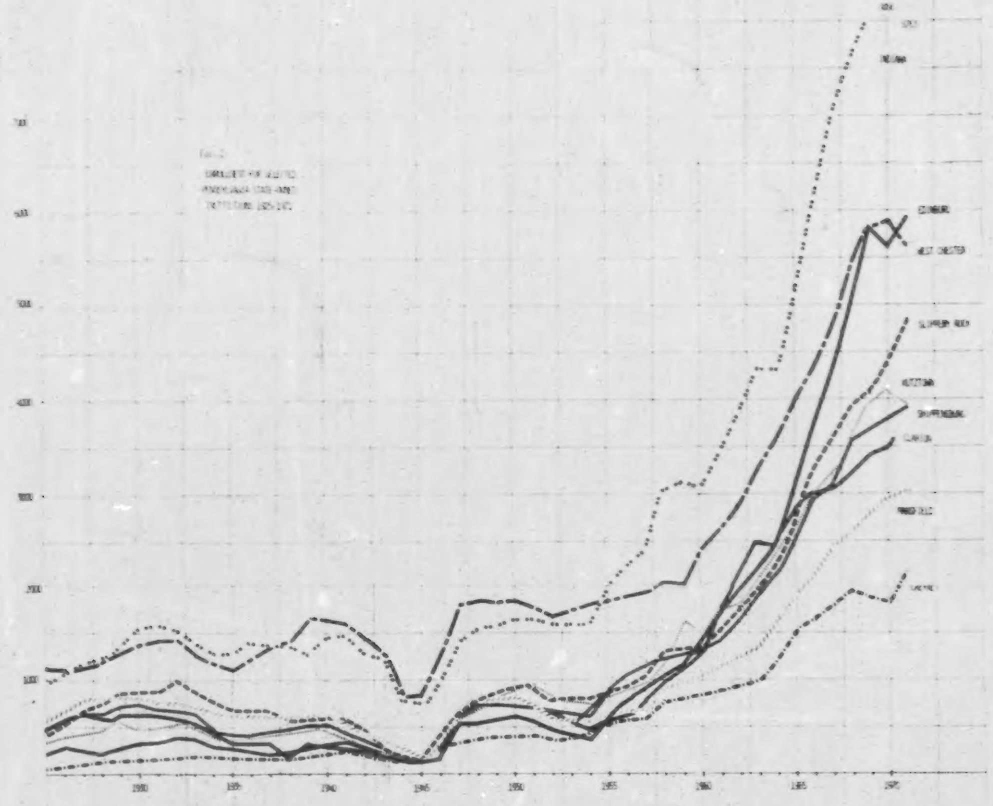


FIG. 1: UNDERGRADUATE ENROLLMENTS, BY YEAR,
PENNSYLVANIA STATE-OWNED INSTITUTIONS:
1925 TO 1971 (IN THOUSANDS)



ENROLLMENT FOR SELECTED
PENNSYLVANIA STATE-OWNED
INSTITUTIONS 1925-1971

Fig. 3: Bachelors' Degrees Awarded, By Year, Pennsylvania State-Owned Institutions: 1929 to 1971 (in thousands)

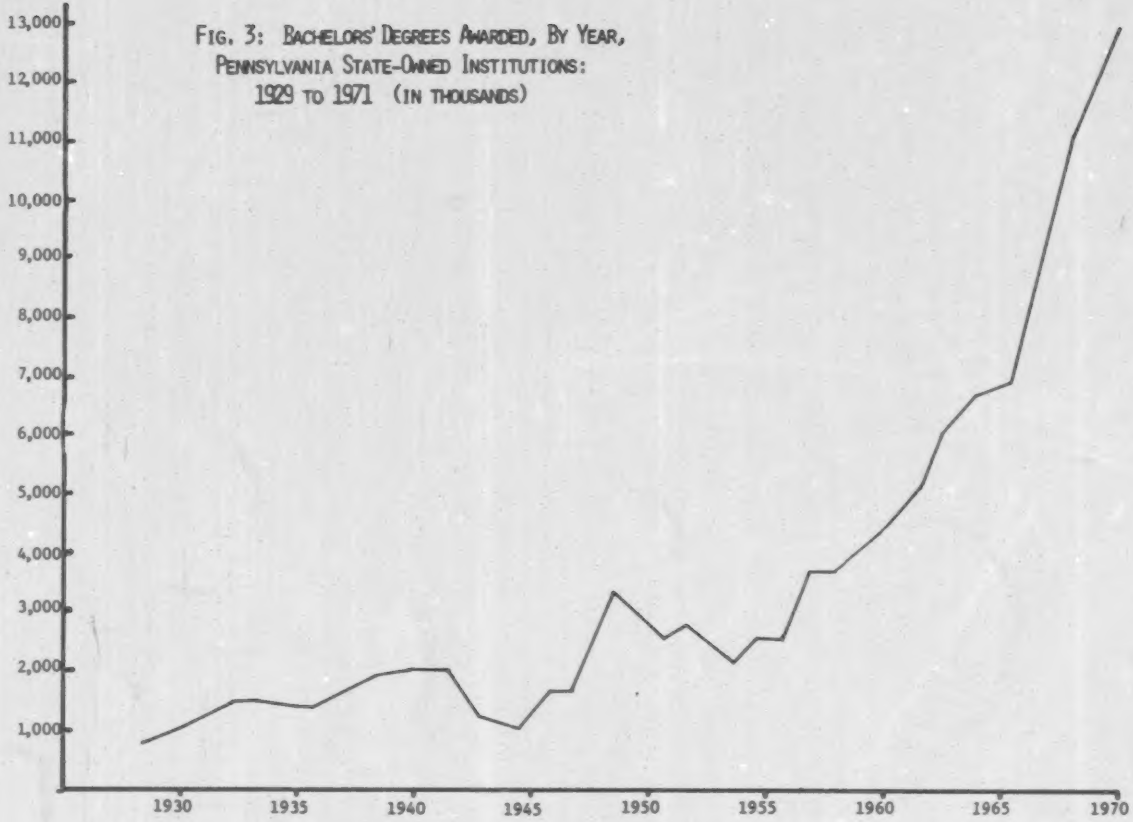


FIG. 4: ANNUAL RATE OF INCREASE UNDERGRADUATE ENROLLMENT

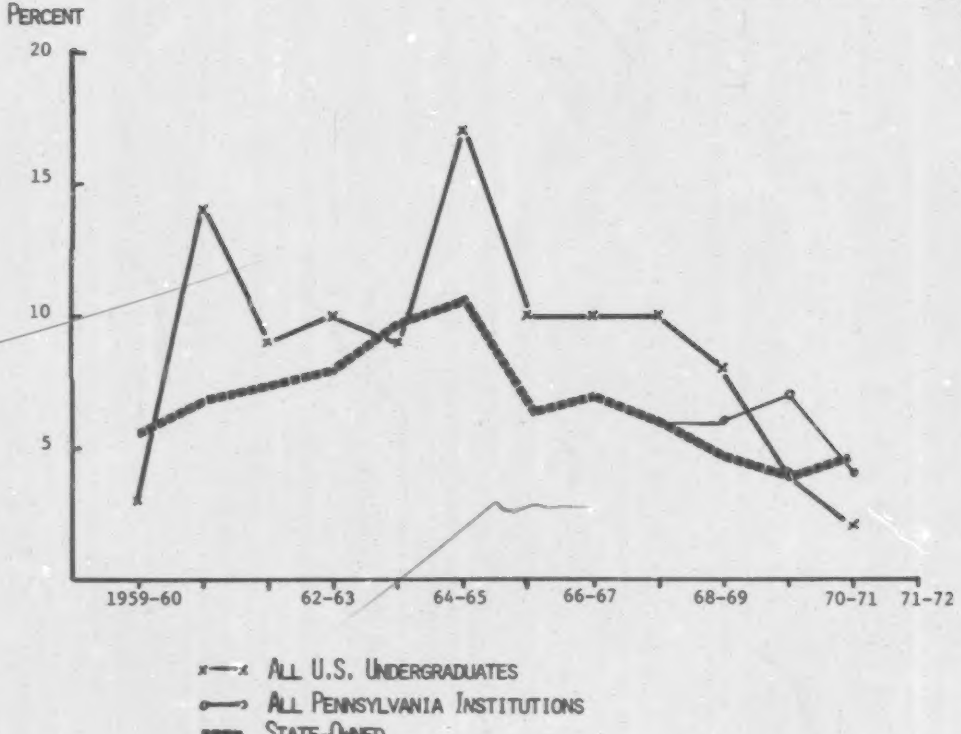


FIG. 5: RATIO OF ENROLLMENT TO DEGREES, BY YEAR,
PENNSYLVANIA STATE-OWNED INSTITUTIONS:
1932 TO 1970

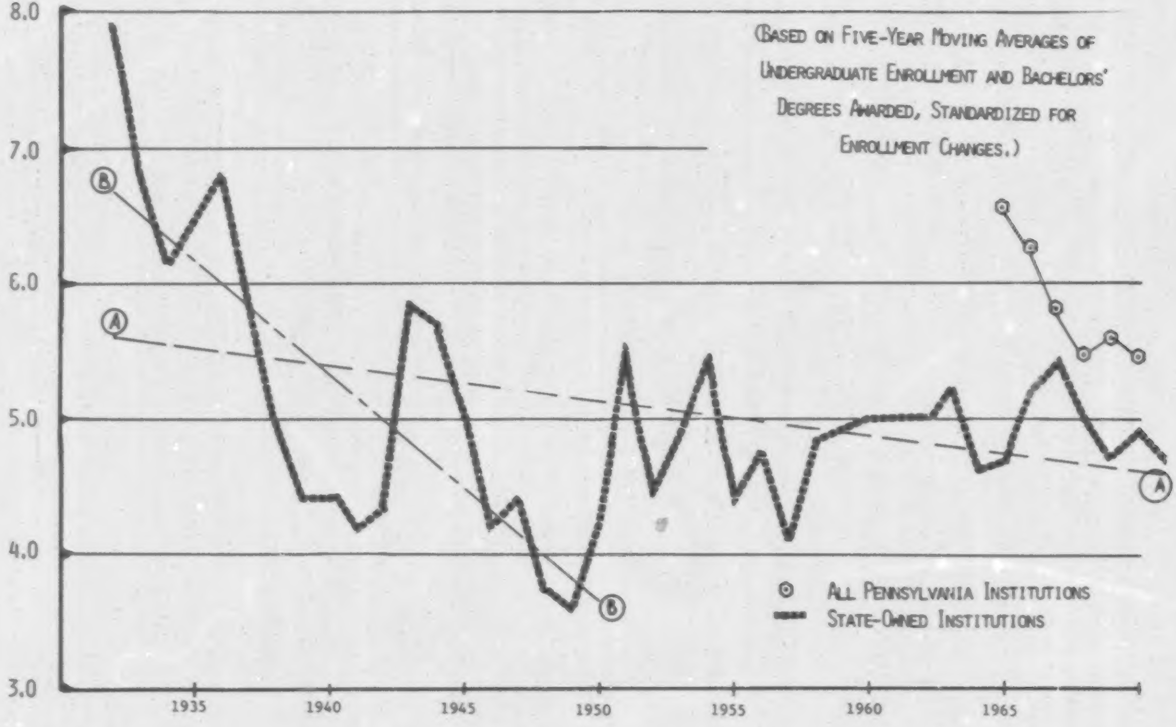
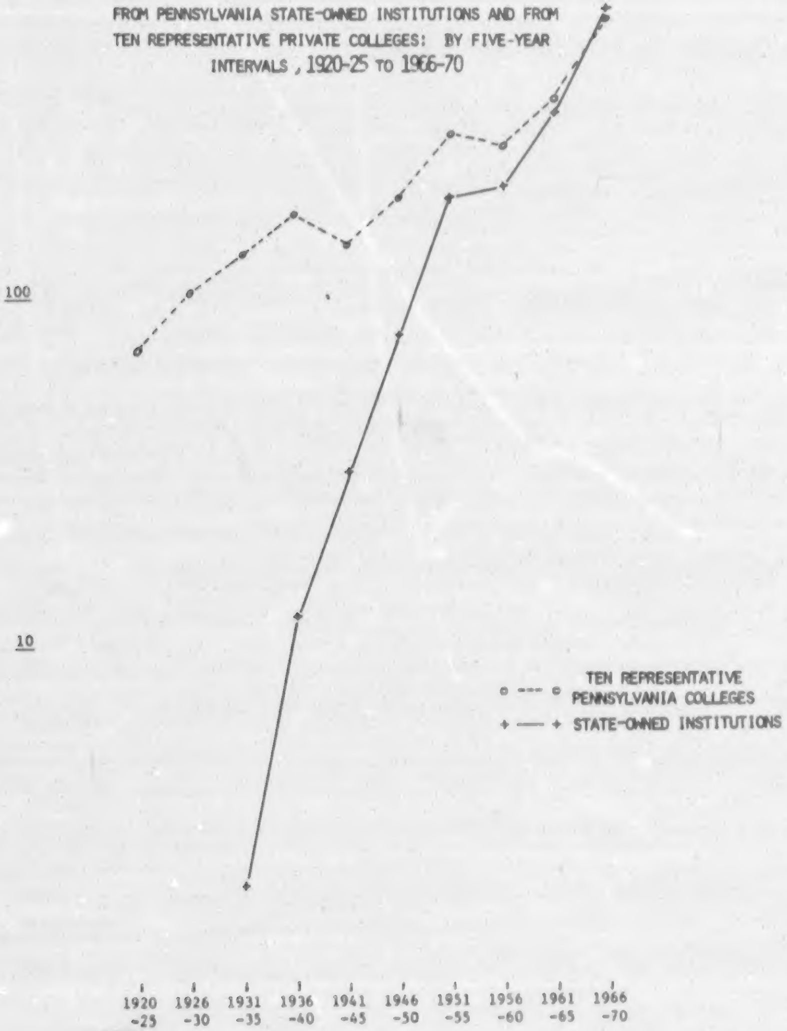


Fig. 6:

DOCTORATE RECIPIENTS IN U.S. WITH BACCALAUREATES FROM PENNSYLVANIA STATE-OWNED INSTITUTIONS AND FROM TEN REPRESENTATIVE PRIVATE COLLEGES: BY FIVE-YEAR INTERVALS, 1920-25 TO 1966-70



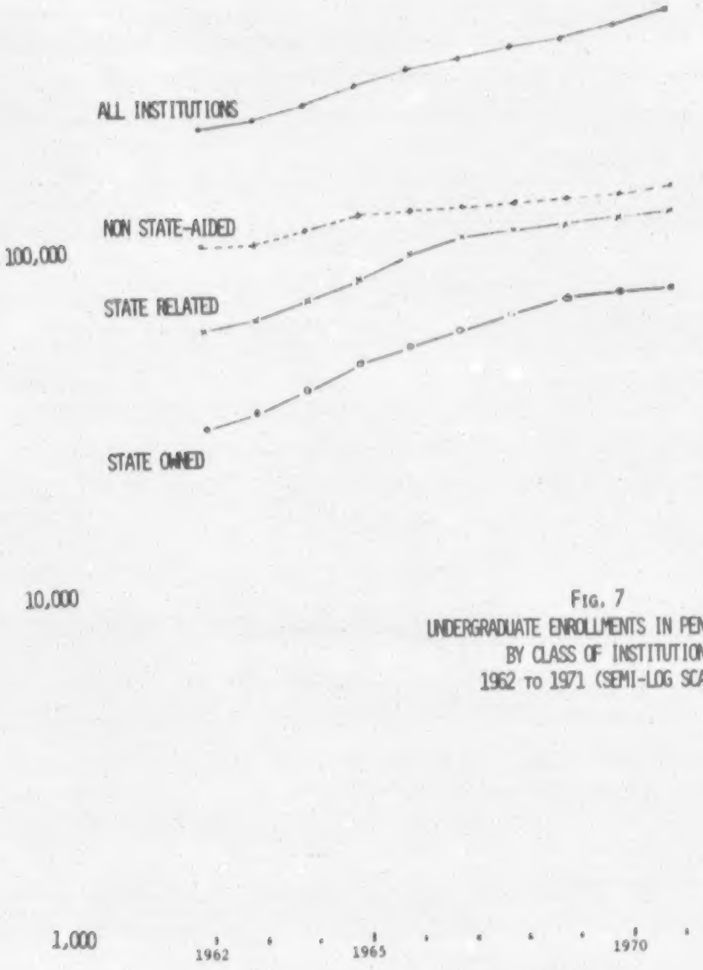


FIG. 7
UNDERGRADUATE ENROLLMENTS IN PENNSYLVANIA
BY CLASS OF INSTITUTION
1962 TO 1971 (SEMI-LOG SCALE)

THE QUALITY OF GRADUATE STUDIES: * PENNSYLVANIA AND SELECTED STATES

William Toombs and Stephen D. Millman

It is a minor paradox of higher education that graduate study, acknowledged to be the most costly and complex phase of university activity, should have the least attention. Institutions vary widely in the amount of self-inquiry they direct toward graduate work, and information collected over a wider area by standard methods has been difficult to come by. Several national studies conducted recently under the auspices of the American Council on Education, however, offer a useful means of making local and regional comparisons.[1] When the data are rearranged into regional or local subsets, the kind of relationships that are revealed give clues about the effects of past policy and future planning, clues that are not attainable by other means.

This study collects and organizes the basic data from the Roose-Andersen evaluation of graduate faculty to give comparisons that have special significance for Pennsylvania. The collected information for the Commonwealth is compared with similar data for New York, Illinois, Michigan, Ohio, and California, and for the top ranked fifty schools in the study. The nature of the relationships between enrollment and ranking, the number of fields and ranking, and resident students enrolled and ranking make possible some rather clear observations about graduate education in the state.

Graduate Evaluation: A Look at Precedents

In 1861, a precedent was set in American higher education; for in that year Yale awarded the first Ph.D.s in American history. It is fair to assume that the ink was hardly dry on the parchment before questions arose concerning the quality of that small doctoral program at Yale. "By 1876, the year that Johns Hopkins dedicated itself to the development of the Ph.D., the precedent set by Yale was being followed in twenty-five institutions, which that year awarded a total of forty Ph.D. degrees."[2] By this time, the American penchant for competitiveness must certainly have spawned a desire to know which program was the best and why. Such judgments were no doubt made, but they appear to have been made individually and with varying degrees of individual knowledge.

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*Originally Center Report No. 14, February 1972.

[1] Kenneth D. Roose and Charles J. Andersen, *A Rating of Graduate Programs* (Washington, D.C.: American Council on Education, 1970); and John A. Creager, *The American Graduate Student: A Normative Description* (Washington, D.C.: ACE Research Reports) 6 (5) 1971.

By the turn of the century, however, it became obvious that the task of evaluating or grouping schools offering studies leading to the doctorate needed to be approached with more rigor. It is not surprising, therefore, that in the year 1900, fourteen institutions, which together accounted for 88 percent of all doctorates awarded at that time, came to form the Association of American Universities. While the AAU never set about formally to evaluate institutional programs, it has served a function which might be called evaluation and certification by regulating admission to its ranks. Proposals to make more specific inquiries have been suggested, but not adopted—albeit narrowly so.[3] Nonetheless, membership in AAU has served as an indicator of academic quality to many, including German institutions which, at the time of AAU's formation, were attracting numerous American scholars. Membership has grown from the original fourteen to the present number of forty-six. To see clearly that membership is still an evaluative measure, one need only note that those forty-six members stand in an exceptional condition when compared with the Council of Graduate School's current membership of 300. (Membership in CGS is open to institutions that have granted thirty graduate degrees, A.M., M.S., or Ph.D., in at least three fields over a three-year period.)

In 1925, Raymond Hughes undertook a modest but pioneering study of the quality of graduate training which was reported to the annual meeting of the American Council on Education.[4] This first formal national ranking was followed in 1934 by another study performed by Hughes. The place of formal evaluation of graduate departments by peer judgment had now been established.

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[2] Frederick Rudolph, *The American College and University* (New York: Vintage Books, 1962), p. 335.

[3] G. O. Arlt, "Purifying the Pierian Spring," The *Graduate Journal* 8 (1971): 237-276.

[4] D. A. Robertson, ed., *American Universities and Colleges* (New York: Scribner, 1928), pp. 161-163.

Hayward Keniston was commissioned in 1957 to evaluate graduate programs in the arts and sciences at the University of Pennsylvania.[5] In order to compare the quality of programs in twenty-eight fields at Penn, Keniston collected and analyzed evaluations of that institution along with the other members of the AAU, which then numbered twenty-five.

In addition, various professional organizations have undertaken evaluation studies of graduate programs in their specific disciplines. Such research has been done in history, English, American literature, physics, sociology, psychology, education, and some other fields.

During the 1964-65 academic year, Allan M. Cartter, then vice-president of the American Council on Education, introduced a new evaluation of the quality of graduate programs.[6] Although there is obviously no perfect way of making such evaluations, many believe the Cartter method to be the most thorough yet devised. At first glance it might appear that such objective yardsticks as size and "quality" of faculty, nature of facilities, type and quantity of funding, etc., might yield a reasonable indication of relative quality among institutions. However, these physical attributes may or may not directly affect the quality of the resulting educational experience. Cartter chose to use the tool of peer evaluation by soliciting the opinion of scholars in regard to their view of quality departments in their field. Such a process is consistent with the use of professional peer judgment as it exists in the medical, legal, and engineering professions.

It was specifically suggested by the study advisory committee that the 1964 study be replicated within five years "to avoid 'fixing' reputations when in fact the academic scene is changing constantly."

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[5] H. Keniston, *Graduate Study and Research in the Arts and Sciences at the University of Pennsylvania* (Philadelphia: University of Pennsylvania Press, 1959).

[6] Allan Cartter, *An Assessment of Quality in Graduate Programs* (Washington, D.C.: American Council on Education, 1966).

Following through on this recommendation, a replication with certain modifications was conducted in 1969 by Kenneth D. Roose and Charles J. Andersen.

As with the Cartter study before it, the Roose-Andersen report triggered criticism in regard to rationale and methodology. As Logan Wilson, president of ACE pointed out, "In general, the unhappy critics are those whose institutions did not stand up in the ratings."[7] In bearing out this point, Dutka indicates great dissatisfaction with the report at Columbia, the institution which appears to exhibit the greatest slippage between 1964 and 1969. She notes, "Most professors quickly point out the inability of outsiders to accurately judge the effectiveness of a program, the vagueness of the wording on the questionnaire, the random character of the sample, and the built-in time lag."[8]

Other criticisms were not tied to a particular institution's individual woes. Jacobson notes the following points which arose at an ACE news briefing to discuss the report:

1. The selection of respondents was made on criteria more than ten years old, thereby creating a bias against newer programs.
2. Some evaluators may have used the catchall "not sufficient information" as a kind way of expressing low esteem.
3. The disciplines studied excluded a number of fields, including education, agriculture, and medicine.
4. All evaluations were one and one-half years old when reported.
5. Some fields had more judges than others.

While the method of peer evaluation may be subjective, a more objective assessment of the outputs of higher education has not yet been fully operationalized although it is under investigation.[9] In any case, decisions such as what students apply, what faculty are attracted, and what grants are awarded are probably made largely on the basis of subjective judgments rather than truly objective criteria. Reputation, no matter how imperfect or inaccurate, is a factor to be recognized.

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[7] R. L. Jacobson, "Ratings of Graduate Departments Raise Questions About Who's 'Best,' " *Chronicle of Higher Education*, January 11, 1971, p. 9.

[8] E. Dutka, "Poor Marks for Columbia Graduate School," *Change* 3 (1971): 33-34.

[9] B. Lawrence, G. Weathersby, and V. W. Patterson, eds., *Outputs of Higher Education* (Boulder, Colo.: WICHE, July 1970).

The initial Cartter report and the Roose-Andersen study of graduate quality dealt with two components—rated quality of graduate faculty and rated quality of doctoral programs. The present study deals exclusively with the first component, an emphasis that has been traditional for inter-university comparisons.

American Council on Education Studies

The Cartter study reported strengths of leading individual institutions by general areas of study. This was as close as the study came to making overall judgments. Any evaluation based on a combination of rankings was eliminated from the 1969 data. Roose and Andersen state, "In this new survey, we have tried to deemphasize the pecking order relationships inherent in most scoring systems, for it is not our purpose to bolster or deflate egos. We have, therefore, not presented scores for individual institutions."[10]

However, if ACE was not willing to publish comparative rankings of institutions, others were quite ready to draw inferences that depended upon an aggregation of the departmental data. Jacobson reports, "The council's report scarcely had been made public when a number of universities sent out news releases of their own, mainly to call attention to survey results that were favorable to them. At least one institution used its own statistical weighting to give itself a higher comparative standing than it had attained in the list of those most often in the top five."[11]

Raymond Ewell has developed a simple method for constructing composite scores for institutions. The approach, which was first used in reference to the Cartter study, is described elsewhere.[12] Basically, the technique is as follows. Institutions are awarded points in accordance with their ranks in individual fields. For each field, a university gets the points indicated below. The composite score for an institution is the sum of the points for all fields in which it was rated.

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[10] Roose and Andersen, *A Rating of Graduate Programs*, p. 2.

[11] R. L. Jacobson, "Ratings of Graduate Departments," p. 9.

DISTINGUISHED/STRONG – – – –	Inverse rank + 14 points*
GOOD – – – – – – – – – – – – – –	10 points
ADEQUATE PLUS – – – – – – – –	5 points

*BY USING THIS METHOD, WEIGHT IS GIVEN TO FIELDS WHICH HAVE THE GREATEST NUMBER OF *DISTINGUISHED/STRONG* ENTRIES. THE CONSTANT OF 14 ASSURES THAT EVEN THE LOWEST IN THIS CATEGORY GET FIVE MORE POINTS THAN THOSE RATED *GOOD*.

Ewell notes in his report, "I checked this rating system with Dr. Cartter, and he felt that this was the best of several systems which had been proposed to convert his disciplinary data into composite ratings for inter-university comparisons."[13]

When the departmental evaluations gathered by the Roose-Andersen study are weighted and summed by Ewell's method we have a composite score for each institution. Such a conversion was tabulated by J. William Johnston, and his summary provided the basic institutional scores cited in the paragraphs and tables that follow.[14] The relation of institutional characteristics and department ratings has been the object of some speculation but not of definitive study.[15]

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[12] R. Ewell, "A Quantified Summary of the American Council on Education Report 'An Assessment of Quality in Graduate Education' [Cartter Study]," mimeographed (SUNY at Buffalo: Office of the Vice-President for Research, December, 1967).

[13] Ibid., p. 2.

[14] J. W. Johnston, "A Composite Ranking of Institutional Graduate Disciplines Based on the American Council on Education Report 'A Rating of Graduate Programs' [Roose-Andersen study]," mimeographed (University Park: The Pennsylvania State University, September 11, 1971).

The Aim and Method of The Study

In the present study certain objective information about institutions is compared with the aggregated Ewell ratings. The central focus is on Pennsylvania institutions. They are compared with those of Ohio, Michigan, New York, Massachusetts, Illinois, and California. This frame of reference allows some comparison of the collective rankings for Pennsylvania with states that are similar in population: Ohio, Illinois, and Michigan, and with states that have a somewhat similar pattern of public and private institutions: Ohio, Massachusetts, and New York. It also permits a contrast of Pennsylvania with states that are heavily committed to public higher education: California, Michigan, and Illinois. Pennsylvania merits this distinctive set of comparisons because of its unusual pattern of public support. For some years now it has been the practice to provide Commonwealth funds to three classes of institutions that are known as "state-owned," "state-related," and private "state-aided." From total higher education appropriations of $261 million in 1970–71, the fourteen "state-owned" colleges have been financed by the state in [illegible] amount of $73 million. A larger segment of the state funds for higher education has been selectively distributed—some would say scattered—among the "state-related" institutions ($148 million) and the "state-aided" institutions ($23 million). The Roose-Andersen data in an aggregated form offer a means of commenting on this practice of distributing support among a group of quasi-public and semi-public institutions.

Another set of more general comparisons is also reported in this study. The rankings which originate with professorial judgments are correlated with other institutional attributes to see whether there are any marked associations between the gross features of an institution—total enrollment and graduate enrollment, for example—and the collective score or rankings.

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[15] R. Smith and F. E. Fiedler, *The Measurement of Scholarly Work in Academic Institutions;* Technical Report No. 70-2 (Seattle, Washington: University of Washington, February 1970).

Roose has recently studied the characteristics of the 50 top-rated institutions, drawn from the 130 whose programs were rated in 1969. He feels that analysis of the top 50 is especially critical in a period characterized by budgetary restraint and limited expansion. For this reason, the present study considers characteristics of the top 50 as well as of the selected states. In all comparisons, each institution is described in terms of the following characteristics:

1. Rank-order of institution by composite score.
2. Ewell composite score.
3. Number of fields rated.
4. Total enrollment.
5. Graduate enrollment.
6. Percent of total enrollment accounted for by graduate enrollment.
7. Type of control, public or private.

Results

Preliminary Comments

Three qualifications need to be stated at the outset of this presentation. First, the present study is essentially a descriptive one. It simply introduces a comparison of relationships that were not included in the original Roose-Andersen analysis but which may show interesting relationships. The features portrayed are characteristics of the educational landscape rather than origins of institutional excellence. Second, the effect of a top-rated department on the judgments given other departments within that institution cannot be accurately gauged.[16] However, it would seem reasonable to hypothesize that a university is more than the sum of its parts and thus the effect of a top department would be more than merely additive. That is, if the present study errs slightly in measuring overall institutional rating, it does so on the side of underplaying the total quality of individual institutions.

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[16] Smith and Fiedler, *Measurements of Scholarly Work.*

Third, it should be kept firmly in mind that the ratings are of *graduate* programs. What direct and indirect effects such quality has on the undergraduate education, research, and service activities of particular institutions is not only difficult to measure but highly idiosyncratic to the local campus setting. Spin-offs from graduate quality are, no doubt, plentiful. They are not, however, within the scope of this paper.

The Top Fifty

Table 1 above displays the institutions whose composite scores place them in the top fifty in the nation. The table also indicates number of fields rated, the various indexes of enrollments, and type of control for each institution. This particular collection of data allows us to examine the relationship between a ranking based upon peer judgment and several attributes of an institution. Product moment correlations were computed by Pearson's method for the intercorrelation of all variables. For convenience, a level of probability of $\leq .05$ is taken as significant.

We turn first to the relationship between composite score and the number of fields rated. Considering the fact that there is a prescreening which determines whether a field at a given institution is even included in the evaluation survey, one might hypothesize that the more fields an institution has rated, the better its position might be. This supposition is supported by the possibility that excellence in one field, mathematics for example, might have a "halo" effect upon judgments made of other disciplines; physics, astronomy, and engineering, for example. A significant relationship of $r = .72$ was found between the composite score and the number of fields rated. This suggests that an institution striving to improve its position in these national rankings might be wiser to consider a strategy for general improvement in a number of fields rather than a concentration upon one or two "star" departments.

It might also be hypothesized that the ratings might be improved by having more students enrolled since alumni might then constitute a greater share of the professionals making the judgment. When total enrollment of the institution was compared with the composite score, a correlation of .26 was generated. This degree of association does not support the hypothesized notion,

TABLE 1
TOP 50 INSTITUTIONS: RANKED BY COMPOSITE SCORE

Institution	Rank	Composite Score	Fields Rated	Total Enroll.	Graduate Enroll.	% Total in Graduate Enroll.	Control Pub = P Priv = I	Doctorates Awarded 1946-66
U.C.–Berkeley	1	1156	35	28863	9144	31.7	P	3238
Harvard	2	1095	34	19136	6268	46.1	I	2433
Michigan	3	964	36	37283	10328	27.7	P	2603
Stanford	4	945	32	11556	5326	46.1	I	1935
Yale	5	919	34	8665	3035	35.0	I	1800
Wisconsin	6	912	36	32000	8782	26.6	P	2730
Chicago	7	853	31	10464	6041	57.7	I	2079
Princeton	8	844	32	4756	1478	31.1	I	1721
Illinois	9	819	36	44806	9387	21.0	P	3933
Cornell	10	790	33	14102	3870	27.4	I	2007
U.C.L.A.	11	788	34	29070	8759	30.1	P	1005
Columbia	12	734	34	17459	6528	37.3	I	2501
U of Washington	13	662	34	30357	6560	21.6	P	909
U of Penn	14	642	32	19417	6606	34.0	I	1044
M I T	15	642	20	7730	3390	43.9	I	4354
Minnesota	16	611	33	58304	8457	14.5	P	1470
Johns Hopkins	17	605	26	11278	3072	27.2	I	1385
Indiana	18	579	32	47806	11009	23.0	P	675
Texas	19	576	32	30628	5538	18.0	P	1229
Cal Tech	20	513	16	1520	774	50.9	I	1714
Northwestern	21	510	32	17239	4084	23.7	I	1123
Brown	22	399	24	5042	1528	30.3	I	675
Duke	23	398	23	7552	1622	21.5	I	481
Purdue	24	397	21	34263	5201	15.2	P	2197
North Carolina	25	390	25	15601	3483	22.3	P	592
Michigan State	26	389	30	38758	10439	26.9	P	617
N Y U	27	363	29	34582	14602	42.2	I	1324
Ohio State	28	352	32	38834	7602	19.6	P	2215

TABLE 1 (cont.)

Institution	Rank	Composite Score	Fields Rated	Total Enroll.	Graduate Enroll.	% Total in Graduate Enroll.	Control Pub = P Priv = I	Doctorates Awarded 1946-66
Washington U	29	344	25	11908	2548	21.4	I	454
U of Rochester	30	330	24	8423	2043	24.3	I	548
Iowa	31	300	29	18659	4777	25.6	P	1061
Rockefeller U	32	295	10	138	128	92.8	I	4
Brandeis	33	294	15	2707	744	27.5	I	71
Case Western Res	34	291	21	10927	3606	33.0	I	792
Penn State	35	288	28	33742	5009	14.9	P	1379
Oregon	36	282	24	13980	3530	25.3	P	149
U.C.–Davis	37	281	16	10161	2367	23.3	P	100
Colorado	38	259	28	18280	4195	23.0	P	589
U of Pittsburgh	39	238	26	22067	7665	34.7	P	819
U.C.–San Diego	40	236	10	3070	1148	37.4	P	no data
SUNY Buffalo	41	230	24	19113	4781	25.0	P	176
Kansas	42	223	26	15791	3198	20.3	P	538
Iowa State	43	209	18	16925	2696	15.9	P	1498
Rice	44	209	19	2830	816	28.8	I	437
Southern Cal	45	206	23	18692	6223	33.3	I	261
Syracuse U	46	192	26	20254	4382	21.6	I	401
Rutgers	47	187	21	15142	5767	38.1	P	459
Vanderbilt	48	186	21	5558	1198	21.6	I	226
Virginia	49	185	18	18379	6861	37.3	P	538
Carnegie Mellon	50	168	9	5228	1406	26.9	I	974

SOURCES: Rank, Composite Score (Johnston)
Number of Fields Rated (Roose-Andersen)
Control, Enrollment–as of 1968-69–(National Center for Educational Statistics)
Doctorates Awarded–(Doctorate Recipients from U.S.–N.A.S.)

but perhaps only the graduate students should be counted, since the rating deals with graduate activity. When graduate enrollment was compared with composite score, a slightly increased correlation coefficient was generated (r = .34), but it is much too low to support any idea about a significant influence of one factor upon the other. Viewed through the eyes of an institution that aspires to improve its ranking, these data suggest that merely undertaking a program for growth in the number of graduate students will not materially aid quality.

Enrollment figures, however, are momentary and may or may not accurately reflect a university's production of scholars over an extended period of time. When we consider the number of doctorates which each institution has awarded in the twenty-year period ending in 1966, it is found that this figure correlates significantly with composite score (r = .72).

A larger number of professionals having graduated from a particular institution would appear to have a favorable effect on ratings in at least two ways. First, a greater number of raters will have experienced a direct exposure to the institution's programs. Second, more raters will have indirect knowledge of the institution's program through contact and interaction with colleagues who have attended that institution.

In terms of relative quality as reflected in the composite scores of the top fifty there is little difference between the public and private groups. Private institutions show a slightly higher mean score (510 vs. 470), but this is not significant. When each of the groups is examined by correlating scores with enrollment, some interesting distinctions appear. The public institutions tend to have significantly larger enrollments, as one might expect, with graduate students constituting about 25 percent of the total. Private institutions with smaller average enrollments have a larger share of their students (35 percent) in graduate study. Among the public institutions there is a significant correlation between total enrollment and composite score (r = .55), and a similar relationship between graduate enrollment and composite score (r = .68). This condition does not appear among the private institutions.

TABLE 2
BASIC DATA FOR SELECTED INSTITUTIONS IN SEVEN STATES

Table 2A

Pennsylvania

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
U of Penn	14	642	32	19417	6606	34.0	PVT*
Penn State	35	288	28	33742	5009	14.9	PUB≠
U of Pitt	39	238	26	22067	7665	34.7	PUB≠
Carnegie-Mellon	50	168	9	5228	1406	26.9	PVT
Bryn Mawr	62	101	10	1152	585	50.8	PVT
Lehigh	87	49	3	4982	1830	36.7	PVT
Temple	109	15	3	33284	6197	18.6	PUB
TOTALS		1501	111	119872	29298	= (24.4)	
MEANS			15	17124	4185		

*State-Aided

≠State-Related

Focusing on Pennsylvania

The next phase of comparison considers the Pennsylvania institutions which fall into the total group of rated institutions consisting of 130 universities nationwide. Because our concern is for the Commonwealth as a whole, all data for institutions in the Commonwealth has been grouped. Three Pennsylvania institutions fall outside the top 50, but within the total 130 (Bryn Mawr, Lehigh, and Temple), while four (Penn, Penn State, Pitt, and Carnegie-Mellon) are within the upper group.

Pennsylvania vs. the Top Fifty. A first step is to compare collected information on Pennsylvania institutions with the aggregate data for the top fifty institutions. On several characteristics there is no real difference. Mean total enrollments are about the same and graduate enrollments are also very similar. In the number of fields rated, however, there is a rather surprising difference. For the top fifty universities the mean number of fields rated is twenty-six, while for Pennsylvania the mean is only fifteen.

This condition reflects more specialization within institutions of this state than one finds in the group of top institutions nationally. It suggests that the Commonwealth, to improve the general quality of its graduate education, might examine the variety of graduate offerings at principal institutions to insure a full meausre of opportunity for its most able citizens.

Pennsylvania vs. Selected States. A second step involves the comparison of Pennsylvania data with collected information of other states. Information on Pennsylvania institutions is contained in the table above. The states in the present sample accounted for twenty-eight of the top fifty institutions (56 percent). By individual states we find the following distribution of those in the top fifty versus those in the total sample: Pennsylvania–4:7, Ohio–2:4, Michigan–2:3, New York–7:12, Massachusetts–3:6, Illinois–3:6, and California–7:10. Detailed information for other selected states is provided in the series of tables which follows.

We have already noted that the policy by which institutions of higher learning receive funds in Pennsylvania is unique. There are "state-owned" institutions–the fourteen state colleges, a group of three "state-related" Commonwealth universities, and three major

TABLE 2
BASIC DATA FOR SELECTED INSTITUTIONS IN SEVEN STATES

Table 2B

Ohio

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
Ohio State	28	352	32	38834	7602	19.6	PUB
Case Western Reserve	34	291	21	10927	3606	33.0	PVT
Cincinnati	71	78	11	26627	3804	14.3	PUB
Ohio U	113	5	1	16287	1898	11.7	PUB
TOTALS		726	65	92675	16910	= (18.3)	
MEANS			16	23168	4227		

TABLE 2 (cont.)

Table 2C

Michigan

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
Michigan	3	964	36	37283	10328	27.7	PUB
Michigan State	26	389	30	38758	10439	26.9	PUB
Wayne State	84	50	9	32370	6939	21.4	PUB
TOTALS		1403	75	108411	27706	= (26.0)	
MEANS			25	36137	9235		

TABLE 2 (cont.)

Table 2D

New York

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
Cornell	10	790	33	14102	3870	27.4	PVT
Columbia	12	734	34	17459	6528	37.3	PVT
N Y U	27	363	28	34582	14602	42.2	PVT
U of Rochester	30	330	24	8423	2043	24.3	PVT
Rockefeller U	32	295	10	138	128	92.8	PVT
SUNY Buffalo	41	230	24	19113	4781	25.0	PUB
Syracuse U	46	192	26	20254	4382	21.6	PVT
Yeshiva U	53	145	8	5528	1513	27.4	PVT
Brooklyn Poly	68	81	6	5715	2995	52.4	PVT
Rensselaer	77	60	8	5144	1355	26.3	PVT
Fordham	99	20	4	10542	1897	18.0	PVT
New School	99	20	4	2609	2125	81.5	PVT
TOTALS		3260	209	143609	46219	= (32.2)	
MEANS			17	11967	3851		

TABLE 2 (cont.)

Table 2E

Massachusetts

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
Harvard	2	1095	34	19136	6268	32.8	PVT
M I T	14	642	20	7730	3390	43.9	PVT
Brandeis	33	294	15	2707	744	27.5	PVT
U of Mass	54	134	17	15202	3467	22.8	PUB
Boston U	88	45	9	23011	5134	22.3	PVT
Tufts	93	35	6	5048	825	16.3	PVT
TOTALS		2245	101	72834	19828	= (27.2)	
MEANS			16	12139	3304		

TABLE 2 (cont.)

Table 2F

Illinois

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
Chicago	7	853	31	10464	6041	57.7	PVT
Illinois	9	819	36	44806	9387	21.0	PUB
Northwestern	21	510	32	17239	4084	23.7	PVT
Illinois Tech	84	50	7	8471	2023	23.9	PVT
Southern Ill	97	25	4	19260	3736	19.4	PUB
Loyloa (Chicago)	109	10	2	12651	3133	24.8	PVT
TOTALS		2267	112	112891	28404	= (25.2)	
MEANS			20	18815	4734		

TABLE 2 (cont.)

Table 2G

California

A Institution	B Rank	C Composite Score	D Fields Rated	E Total Enroll.	F Graduate Enroll.	F/E % Total in Grad. Enroll.	G Control
U.C.–Berkeley	1	1156	35	28863	9144	31.7	PUB
Stanford	4	945	32	11556	5326	46.1	PVT
U.C.L.A.	11	788	34	29070	8759	30.1	PUB
Cal Tech	20	513	16	1520	774	50.9	PVT
U.C.–Davis	37	281	16	10161	2367	23.3	PUB
U.C.–San Diego	40	236	10	3070	1148	37.4	PUB
Southern Cal	45	206	23	18692	6223	33.3	PVT
U.C.–Riverside	57	122	13	4183	1121	26.8	PUB
Claremont Grad School	75	64	7	968	939	97.0	PVT
U.C.–San Fran Med	76	662	4	2338	394	16.6	PUB
TOTALS		4373	190	110421	36195	= (32.8)	
MEANS			19	11042	3620		

"state-aided" private institutions. In effect, the resources of the state are distributed rather than concentrated in a smaller group of wholly public institutions. New York is the only counterpart in this tradition, although that state has undertaken major change toward the development of strong public institutions over the last decade.

The two states are quite similar in average number of fields rated. This appears to confirm the idea noted above that when state support is extended to more institutions, more specialization in graduate programs develops. On the matter of average total enrollment there is less similarity, with New York institutions showing a mean of 11,967 and Pennsylvania–17,124. The share of the enrollment in graduate programs is quite different, 32 percent in New York and only 24 percent in Pennsylvania. Pennsylvania may have good reason to expand its graduate opportunity, as well as the number of programs offered.

However, the particular policy of state funding for private institutions may or may not bear any relationship to the actual existence of quality graduate level institutions in the state. For example, Massachusetts is very heavily represented by the private sector, yet the state allocates absolutely no funds for the direct operating costs of private institutions. Clearly then, we need to examine the broader question of the rated quality of public and private institutions in the selected states irrespective of state policy.

Table 3 shows a summary of rated quality in the seven selected states aggregated by control. From this information the differences between the states can be seen most vividly. Not merely state policy but historical development is reflected in the particular divisions between public and private. On one polar extreme are New York and Massachusetts, which up until very recently have both placed the burden for graduate level work on the private institutions of the state. At the other extreme is Michigan which gains all of its composite strength from public institutions. Pennsylvania occupies middle ground, splitting seven institutions about as evenly as one can mathematically, with "three and one-half" institutions in each category. Ohio and Illinois fall on either side of Pennsylvania, with Ohio leaning toward the New York-Massachusetts policy and Illinois tending toward Michigan's. California shows a rather balanced posture and great strength, with somewhat more power in the public sector.

TABLE 3

NUMBER OF INSTITUTIONS AND SUMMED COMPOSITE SCORES FOR SELECTED STATES AND BY CONTROL WITHIN STATES

	All Institutions			Public Institutions		Private Institutions	
State	Number of Institutions Represented	Sum of Composite Scores	Average Score per Institution	No. of Public Institutions Represented	Sum of Public Composite Scores	No. of Private Institutions Represented	Sum of Private Composite Scores
Pennsylvania	7	1501	214	3[†]	541	4[*]	960
Ohio	4	726	182	3	435	1	291
Michigan	3	1403	468	3	1403	0	0
New York	12	3260	272	1	230	11	3030
Massachusetts	6	2245	374	1	134	5	2111
Illinois	6	2267	378	2	844	4	1423
California	10	4373	437	6	2645	4	1728

[†] Includes two "state-related" institutions.

[*] Includes one "state-aided" institution.

The mean scores for the rated institutions in each state may be taken as a rough indication of what that particular state is getting as a return on its total investment, public and private, in graduate education. Pennsylvania is clearly better off than Ohio but substantially below all the others. However desirable it might be, one can say little more on this matter because a number of the institutions are really national or international in the scope of their clientele, thus encompassing more than state interests.

One can also see quite clearly from this table that the states vary in regard to their relative concentration or dispersion of quality graduate programs among institutions. Regarding the subject of dispersion, one can quickly see from Table 3 that Pennsylvania amasses a composite score very near Michigan's, but does so through seven institutions in contrast to Michigan's three. California reflects a higher composite score than New York with fewer institutions, while Massachusetts and Illinois have comparable scores with a like number of institutions for each.

Another way to compare Pennsylvania with other states is through an analysis of states with roughly equivalent populations as seen in Table 4. Ohio and Illinois come closest to Pennsylvania, and one might expect them to show roughly equivalent quality levels. The three, however, show very different total composite scores of quality. Pennsylvania's score is more than double that of Ohio, and Illinois' is half again higher than Pennsylvania's. The table presents a ratio of judged quality per state to population. While this measure is meant to assess general accessibility to quality graduate programs for residents of a state, it does not reflect two other important attributes of actual access—degree of selectivity and amount of student cost.[17] If one takes the ratio of scores to population, it is clear that Pennsylvania extends to its citizens a rather limited opportunity for graduate study of high quality.

Table 5 shows another aspect of general accessibility. The population under scrutiny here, however, is college students who are residents of the selected states. The first comparison relates total score to the number of residents who are students at some college in the United States. The second comparison is of quality scores to the

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[17] W. Willingham, *Free-Access Higher Education* (New York: College Entrance Examination Board, 1970).

TABLE 4

SUMMED COMPOSITE SCORES IN SELECTED STATES AS A FUNCTION OF POPULATION IN STATE

A State	B Sum of Composite Scores	C Population of State* (in thousands)	B/C Score Points Per Capita	Rank
Pennsylvania	1501	11,750	.128	6
Ohio	726	10,610	.068	7
Michigan	1403	8,673	.162	5
New York	3260	18,186	.179	4
Massachusetts	2245	5,438	.413	1
Illinois	2267	10,958	.207	3
California	4373	19,179	.228	2

*As of July 1, 1968

SOURCE: Department of Commerce, Bureau of the Census, *Statistical Abstract of the United States, 1970.*

number of residents who attend college in their home state. Table 5 may be taken as an indication of the quality level a state offers, first, to all its students, and second, to those who choose to remain in the state. Pennsylvania retains its relatively low position in terms of the whole student group, but it is quite similar to New York. We notice, however, that Pennsylvania has the smallest share of students remaining at home. The ratio of quality to students, Column B/E, looks good—comparable to Michigan, New York, and even California—until we remind ourselves that this is achieved by having more than a fifth of the student population go elsewhere.

Because the composite scores reflect the quality of graduate programs only, there is reason for looking only at the graduate student population. Table 6 makes the same comparisons as Table 5 considering only graduate students. A quick comparison of the percentage remaining in the home state as reflected in Table 5 and Table 6 reveals a little more mobility for the graduate students. Californians still find their opportunity at home as do the young people of Michigan. New York appears to have better holding power for its graduate students than for the whole range of student population. Pennsyl-

TABLE 5

SUMMED COMPOSITE SCORES IN SELECTED STATES AS A FUNCTION OF NUMBER OF STUDENTS

All College and University Students				Students Attending in Home State		
A State	B Sum of Composite Scores	C No. of Student Residents of State*	B/C Ratio of Sum of Composite Scores to No. of SRoS	D % Residents in Home State	E No. of Students Remaining** in Home State	B/E Ratio of Sum of Composite Scores to SRe
Pennsylvania	1501	350,287	.0043	78	272,846	.0055
Ohio	726	310,621	.0023	84	259,604	.0028
Michigan	1403	277,135	.0051	92	255,563	.0055
New York	3260	742,182	.0044	81	604,532	.0054
Massachusetts	2245	203,212	.0111	79	160,281	.0140
Illinois	2267	385,221	.0059	79	304,182	.0075
California	4373	810,208	.0054	94	762,198	.0057

*Student Residents defined as "The residents of a State who are enrolled as students in their own State or any other part of the aggregate United States. Foreign students are not included (page x)."

**Those residents attending college in their home state.

SOURCE: National Center for Educational Statistics, *Residence and Migration of College Students, Fall, 1968.*

TABLE 6

SUMMED COMPOSITE SCORES IN SELECTED STATES AS A FUNCTION OF NUMBER OF GRADUATE STUDENTS

	All College and Univeristy Students			Students Attending in Home State		
A State	B Sum of Composite Scores	C No. of Student Residents of State*	B/C Ratio of Sum of Composite Scores to No. of SRoS	D % Residents in Home State	E No. of Students Remaining** in Home State	B/E Ratio of Sum of Composite Scores to SRe
Pennsylvania	1501	46,857	.0320	77	35,972	.0417
Ohio	726	30,056	.0242	76	22,807	.0318
Michigan	1403	32,851	.0427	88	28,857	.0486
New York	3260	123,133	.0265	85	104,319	.0313
Massachusetts	2245	27,006	.0831	78	21,109	.1063
Illinois	2267	42,090	.0539	77	32,552	.0696
California	4373	91,544	.0478	90	82,256	.0531

*Parallels definition in Table 5; considers graduate students only

**Parallels definition in Table 5; considers graduate students only

SOURCE: National Center for Educational Statistics, *Residence and Migration of College Students, Fall, 1968.*

vania still sends a sizeable 23 percent elsewhere and offers those who stay a graduate education of moderate quality. By and large the relationships remain the same among our seven sample states.

Looking into relationships in the Roose-Andersen report leads one to the question of how stable the results might appear in light of the earlier data of the Cartter report. To round out this obvious dimension of inquiry a set of composite scores for the 1964 report was calculated and the basic comparisons made. The comparison of composite scores for those in the top fifty in 1964 with those in the same group for 1969 showed a very high similarity (r = .98). Among the main subgroups reported in the paragraphs above—public vs. private, selected states vs. top fifty—no significant differences appeared. One interesting piece of additional information did emerge when the top fifty for each of the two years was split in half. The top twenty-five in the two reports showed a correlation of .95 by Pearson's method while the low twenty-five gave a value of .77. The locus of change is clearly at the lower end of the scale. The strategy for institutional improvement when confronted with this type of rating system is confirmed: attempt to bring many programs up to a good level and hold them there. While there is little likelihood of a new institution reaching the top twenty-five, the second twenty-five is still quite acceptable company. The major similarities we have noted suggest that a complete replication of this study using 1964 data would give rather similar results. The zone of change is the second quartile, as Table 7 shows.

Conclusions

By using the composite scores derived from the Roose-Andersen study as a reflection of the quality of graduate offerings in institutions, we have been able to generate some information and some indications that cannot be constructed easily by any other means.

First, the composite scores for institutions were tested for relationship with several other attributes: number of fields rated, total enrollment, and graduate enrollment.

1. There is a strong relationship between the number of fields rated and the composite score (r = .72). This suggests that the avenue of institutional improvement lies in

TABLE 7

CORRELATION BETWEEN 1969 AND 1964 COMPOSITE SCORES (PEARSON'S METHOD)

Top 50–All Institutions	.98*
Top 50–	
Upper 25 Only	.95*
Lower 25 Only	.77*
Top 50–	
Private Only	.98*
Public Only	.98*
Top 50–	
Selected States Only	.98*
Pennsylvania–All Rated Institutions	.99*

*Significant at $p \leq .05$.

increasing the number of good departments in the graduate school rather than in creating one or two "star" departments.

2. In general, the size of the enrollment, either total or only graduate, is not significantly correlated with quality as measured by composite score. In the group of public institutions, however, there is an indication that larger numbers of graduate students do relate favorably to higher quality.
3. Institutions which have over an extended period of time awarded a large number of doctorates tend to be rated highly. This is attested to by the high correlation between number of doctorates awarded in the last twenty years and composite score. Greater doctoral production allows greater familiarity with an institution's programs.

Second, the composite scores for institutions were aggregated for the top fifty schools on the list and for seven representative states to give a measure of centrality. The collected score for Pennsylvania's institutions was compared to those of the other states. Each of the six companion states held one or more points of similarity or contrast with Pennsylvania on population, policy, or tradition.

4. In comparison with the top fifty institutions, Pennsylvania showed fewer fields rated per institution, fifteen vs. twenty-six. In view of finding #1, above, and in the light of what is known about the beneficial cross-fertilization among departments, Pennsylvania might well encourage the development of a larger number of graduate programs in its better institutions.
5. In comparison with the seven selected states, Pennsylvania has a relatively low proportion of its total student enrollment in graduate work, 24 percent. Only Ohio is smaller. This reinforces the idea that graduate opportunity for citizens of the Commonwealth should be expanded.
6. When the scores of all institutions in a state are summed, we have an approximation of the quality level of graduate education, public and private, available to the people. The Pennsylvania institutions gathered a total of 1501 score points, placing the state fifth among the seven sample states.
7. When this total score is related in a simple ratio to the factors used in our study, the position of Pennsylvania slips back to sixth place. For example, the ratio of quality points per institution puts the state in the sixth position. The ratio of quality score points to population gives a per capita value which also places the state sixth (Table 4). A similar rank appears when the ratio of quality score points per student is calculated (Table 5), but here the unfavorable position is further intensified by the fact that a sizeable share of the students, 22-23 percent, leave the state to study.
8. A general conclusion is rather clear. Pennsylvania's unique policy of diversified support for higher education does not, in and of itself, appear to be either favorable or unfavorable to the growth of quality in graduate study. To serve her citizens, Pennsylvania needs more graduate programs of good quality in its major institutions. Whether the current policy can encourage the kind of development needed to bring the Commonwealth up to the level of what might be called her "peer

states" is the real question. And, in the light of the data presented here, the emphasis on more high quality graduate programs is no mere cry for expansion. It is the simple recognition of the need for an investment that has been too long postponed.

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EXCEPTIONAL GRADUATE ADMISSIONS AT THE PENNSYLVANIA STATE UNIVERSITY*

Manuel G. Gunne and Larry L. Leslie

Until quite recently the admissions criteria for graduate schools conformed closely to that of the undergraduate patterns established earlier. The determinants of selection were past academic performance and achievement scores on entrance examinations. The rationale behind these two criteria was that they were predictive of future academic success and that applicants with the greatest chance for success should be admitted.

There is some basis for the first assumption, although in general the evidence is meager. High school rank has been shown to be the best single predictor of success in college; however, substantial research relating high school performance and test achievement scores to college success indicates that in absolute terms these criteria by no means insure impressive results.

Such practices have contributed to a situation wherein approximately 40 percent of all college freshmen never receive a baccalaureate degree,[1] and as many as 50 percent of the graduate students in all but the top-ranked universities never complete their doctoral programs.[2] Admissions practices at both levels of higher education were severely criticized by Campbell[3] and Marston[4] in two articles in a recent issue of the *American Psychologist.* A national study of attrition of doctoral candidates showed that even among graduate students with a master's degree, almost 33 percent never attain the doctorate.[5] In fact, in a study of educational research training programs at the graduate level, Fleury and Cappolluzzo reported that entrance requirement variables effectively predicted success only 15 percent of the time, leaving 85 percent still unaccounted for.[6] These circumstances suggest that if the prediction of success is indeed possible at all, other criteria may be more promising.[7]

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*Originally CSHE Report No. 15, March 1972.

[1] Robert E. Iffert, *Retention and Withdrawal of College Students,* Bulletin 1 (Washington, D.C.: U.S. Office of Education, 1958).

[2] Ann M. Heiss, *Challenges to Graduate Schools* (San Francisco: Jossey-Bass, 1970), p. 102.

[3] David C. Campbell, "Admissions Policies: Side Effects and Their Implications," *American Psychologist* 26 (1971): 636-48.

[4] Albert R. Marston, "It Is Time to Reconsider the Graduate Record Examination," *American Psychologist* 26 (1971): 653-6.

At many institutions and in various ways, graduate admissions procedures have changed, partially in recognition of the poor predictive powers of the traditional criteria, and even more vitally in an attempt to remedy social injustices. Clearly, institutions have begun to move away from traditional admissions practices, at least for some students in some institutions. The beneficiaries have often been disadvantaged students, especially balcks,[8] who have been welcomed by institutions intent upon altering their elitist images.

Whether as a result of an effort to correct a social and moral injustice, to ease campus unrest and rebellion, to erect a facade of concern, or to try to be "where it's at," many colleges and universities have begun to admit disadvantaged students in increasing numbers to their graduate programs, under other than traditional criteria. The prospects for success (degree attainment) for many of these students who are exceptions to the traditional may be considered highly limited, but many institutions are taking the risks, with little evidence of adverse effects.[9]

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[5] Allen Tucker, David Gottlieb, and John Pease, *Attrition of Graduate Students at the Ph.D. Level,* Publication 7 (Michigan State University: Office of Research & Development and the Graduate School, 1964).

[6] Bernard J. Fleury and Emma M. Cappolluzzo, *Educational Research Training Programs: Requirements for Admission* (University of Massachusetts: Massachusetts School of Education, 1969).

[7] Marston, "Graduate Record Examination," p. 654.

[8] Lawrence C. Howard, *Graduate Education for the Disadvantaged and Black-Oriented University Graduates* (Washington, D.C.: Council of Graduate Schools in the United States, 1968).

[9] Council of Graduate Schools in the United States, *Programs for Disadvantaged Students in Graduate Schools* (Princeton, N.J.: Educational Testing Service, 1970), p. 3.

These institutions are forming policy in light of the realization that there is no such thing as a culture-free test and that nontraditional, even unconventional, criteria may be more desirable. The American College Testing Program has responded by seeking to design criteria batteries that include evidence of leadership ability, indications of latent motivation and learning capabilities, and most importantly the opinions of knowledgeable instructors and advisors.

The Council of Graduate Schools has surveyed the extent and nature of institutional adjustment to new criteria and has noted that of its 287 member colleges and universities, at least 150, or approximately 59 percent of the respondents to its survey, reported making some provision for exceptional admissions. The Council reports this to be a national upsurge in exceptional admissions to American graduate schools.

The Council study, which is the most comprehensive to date, reports the following pertinent findings:

> Many graduate schools report ten or fewer disadvantaged students enrolled. The number of such students has increased substantially in recent years.
>
> Most of the special procedures and programs were established in 1967 or later. Few changes have been made or are planned.
>
> Substantial numbers of graduate schools waive or liberalize the admissions requirements of previous scholastic records and test scores. Letters of recommendation are the most frequently used additional criteria for evaluating the applicants.
>
> Most of the graduate schools reporting special procedures or programs feel that it is too early to evaluate their effectiveness. Others reported that student achievement has been good or excellent and that the rate of attrition has been low.[10]

Selected Efforts

Particular efforts by individual institutions are worthy of special mention. The University of California at Los Angeles, for example, purposely seeks out high-risk applicants who clearly do not meet traditional requirements and selects its disadvantaged students under a set of admissions criteria obviously quite different from those normally employed.[11] Harvard, Yale, and Columbia run a coordinated intensive summer studies program for similarly disadvantaged but potentially able applicants. These students are selected partially on the basis of a formal application and a transcript of college work, but more consideration is given to a statement of educational aims, a writing sample, an interview, and especially to three faculty recommendations. Motivation and desire are prominent factors considered in these acceptance decisions.[12]

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[10] Ibid.

Wisconsin utilizes a multidisciplinary program approach for high-risk unadmissibles who have been accepted to its graduate school with credentials well below those usually prescribed. After admission, certain helpful steps are taken to improve the student's chances of success.

> Ordinarily a specific faculty member should agree to counsel each student and the department should be prepared to offer a reduced course load, pass-fail grading in some subjects, tutoring, and other special procedures which insure that deficiencies in undergraduate preparation do not prevent the student from progressing toward his degree.[13]

In an attempt to find criteria more appropriate to the culturally and socially different minorities, Oberlin interviews black applicants who are chosen for graduate admissions only after rating them on their "hipness," a composite of competitiveness, high motivation, and self-reliance.[14]

The University of Cincinnati is admittedly unimpressed with undergraduate grade point averages, and looks primarily at the latter part of a student's undergraduate experiences for evidence of problem-solving ability.[15] The students selected are requested to attend a summer institute, not unlike the Harvard-Yale-Columbia program, at which many services similar to those of the Wisconsin program (tutoring, reduced load, and pass-fail) are made available. In reference to problem-solving ability, Cincinnati reports that students who asked for the most help turned out to be the most successful in the program, low gpa's notwithstanding.

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[11] Howard, *Graduate Education.*

[12] Harold M. Stahmer, *The Disadvantaged Student in Graduate School,* The Harvard-Yale-Columbia Intensive Summer Studies Programs (Washington, D.C.: Council of Graduate Schools, 1968).

[13] Donald Carlisle, *The Disadvantaged Student in Graduate School Master's and Doctoral Degree Programs in Predominantly Non-Negro Universities* (Los Angeles: University of California, 1968), p. 11.

[14] William G. Davis and Gordon A. Welty, *The Old System and the New College Students* (Oberlin, Ohio: American College Personnel Association, 1970).

The Penn State Case

Like so many other concerned institutions, The Pennsylvania State University has changed its procedures for admitting applicants to its graduate programs. Prior to 1970, all applications were controlled centrally by the graduate school. Graduation from an accredited baccalaureate-granting institution and at least a 2.5 junior-senior grade point average were the minimum requirements for all applicants. Ordinarily, the graduate school automatically rejected any applications which did not meet these two basic requirements. All minimally acceptable applications were then forwarded to the appropriate departments where, subject to facility limitations, decisions were made according to the criteria developed by each department as its own prerogative.

In the "other-than-ordinary" cases, a department would take the initiative in admitting a student who was known to possess some compensating features or interests. In these cases, the department would ask the graduate school office to forward a particular application in spite of its obvious disqualifying grade point average. Such procedures were not common, however.

In an attempt to decentralize admissions decisions and to make some provision for disadvantaged applicants, the Graduate Admissions Committee formulated a policy, late in 1969, under which all applications would be forwarded directly to the various departments without the graduate school exercising any judgment other than that of determining whether an applicant had attended an accredited institution. No minimum grade point average would be necessary and departments were openly urged to admit some disadvantaged students who ordinarily would have been rejected under the traditional criteria. Departments were further encouraged to make a special effort to locate potentially able disadvantaged students whose records might initially reflect apparent weaknesses in their backgrounds.

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[15] Howard, *Graduate Education.*

In this same report the Graduate Admissions Committee made the following charge to the Dean of the Graduate School:

> For evaluation of the policy for exceptional admissions, the Graduate School shall maintain an annual survey of the effects of exceptional admissions, drawing data from official transcripts and from members of the graduate faculty with the use of the Recommendation Report form appended in this Committee report. Comparisons will be made and reported of students admitted in exception to normal criteria and comparable students who did meet those criteria.[16]

The Effects of Changed Criteria or Standards

Such a charge is not unusual. Institutions nationwide have sought to determine whether the quality of their programs has suffered as a result of exceptional admissions. There is no published evidence that program quality has diminished noticeably. The Council of Graduate Schools' report supports this point. Although most institutions consider that "it is too early to evaluate their [exceptional admissions programs] effectiveness, others report that student achievement has been good—even excellent—and that the rate of attrition has been low."[17] Appraisals of individual programs have yet to reach the journals in large numbers; however, a few such reports have been forthcoming.

Selected Efforts

In the special University of California at Los Angeles program, only 25 percent of the exceptionally admitted students failed to successfully complete their work. (Recall that the national study by

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[16] "Graduate School Bulletin" (University Park, Pennsylvania: The Pennsylvania State University, May 2, 1969), pp. 5-6.

[17] Council of Graduate Schools in the United States, *Programs for Disadvantaged.*

Heiss revealed a comparable 50 percent figure for regular admits.)[18] A comparison of the students who persisted revealed that the entering grade point average requirement appeared rather insignificant when other factors and attributes were taken into account.[19] An almost random relationship was reported to exist between entering gpa and later academic achievement. Those who failed the program did not necessarily have low gpa's at the time of admission.

The notably intensive Harvard-Yale-Columbia summer program showed especially encouraging results in its first two years. As many as 59 percent of the 1966 group continued their graduate work and 71 percent of the 1967 applicants were progressing satisfactorily in that program.[20]

Perhaps no institution surpasses Oberlin in its efforts to devise nonstandard criteria for admission to graduate school. As intimated earlier, the Oberlin research compared three groups of students who differed on the basis of traditional criteria (including gpa) and a concept of "hipness" (competitiveness, high motivation, and self-reliance). Students in the first group met the traditional criteria but they were not hip. The second group of students met the traditional criteria while also being hip. Students in the third group did not meet the traditional criteria, but they were, by definition, hip. Oberlin researchers reported that, "At the end of the first semester, there was no appreciable difference in the distinction of grade point average among the three groups."[21]

The Penn State Case

The discussion thus far has described the results of efforts nationally to evaluate innovative programs for disadvantaged students in graduate schools. The Pennsylvania State University has not sought to rival Oberlin's admissions criteria in originality. That aspect of the issue is left to each department. The University no longer has one all-pervading admissions policy; it is now the complete prerogative of each department to establish its own criteria for exceptional as well as regular admissions. The focus of this study, however, is not on the admissions criteria, but on the comparative success of those students admitted under any exceptional admissions guidelines.

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[18] Heiss, *Challenges to Graduate Schools.*

[19] Carlisle, *The Disadvantaged Student,* p. 19.

[20] Stahmer, *The Disadvantaged Student.*

[21] Davis and Welty, *The Old System.*

Method of the Study

For the purposes of this study the exceptionally admitted students were separated into two subgroups. First, there were those who were exceptional in the traditional sense, since they did not meet the previous university-wide minimum upper-division undergraduate grade point average of 2.5. Second were those who possessed a grade point average above 2.5, but who were still below the required minimum for the department to which they had applied. This group also included those exceptionally admitted students who failed to meet other particular department criteria, e.g., course prerequisites, special entrance tests, etc.

These two subgroups of exceptionally admitted students were compared to a group of randomly selected traditionally admitted students in line with six hypotheses. These hypotheses, stated here in the null convention for the sake of convenience, were tested to ascertain whether any difference existed between these two subgroups of exceptionally admitted students and a group of traditionally admitted (control) students. The six hypotheses were:

1. There are no differences in student performance between students who are admitted to graduate programs with less than a 2.5 grade point average in their junior-senior undergraduate years and those who are admitted with greater than a 2.5 grade point average.
2. There are no differences within departments in student performance between students who are admitted to graduate programs with less than 2.5 grade point averages in their junior-senior years and those who are admitted with greater than 2.5 grade point averages.
3. There are no differences within colleges in student performance between students who are admitted to graduate programs with less than 2.5 grade point averages in their junior-senior years and those who are admitted with greater than 2.5 grade point averages.
4. There are no differences in student performance between students who are admitted to graduate programs

on the basis of special exceptions to department admissions standards and those who are not special exceptions to department standards.*

5. There are no differences within departments in student performance between students who are admitted to graduate programs on the basis of special exceptions to department admissions standards and those who are not special exceptions to department standards.*
6. There are no differences within colleges in student performance between students who are admitted to graduate programs on the basis of special exceptions to department admissions standards and those who are not special exceptions to department standards.*

Procedure

Using rosters of new graduate students at The Pennsylvania State University for the summer and fall terms of 1970—terms when most new students are admitted—the evaluators identified students who could be considered exceptional admits since they failed to meet the old university-wide requirement of a 2.5 minimum gpa or the particular acceptance criteria of the various departments of the University. Department admissions requirements vary considerably and may include varying combinations of special tests, standardized tests, course or degree specifications, letters of recommendation, and prescribed grade point average requirements ranging from the old university-wide minimum 2.5 to a high of 3.0.

An examination of the summer and fall 1970 rosters of new graduate students disclosed 110 students who were admitted under exceptional circumstances, i.e., either their undergraduate junior-senior grade point average was less than 2.5 or it was below the grade point average required by the department to which they were applying. Although most current research on exceptional admissions focuses on blacks or other minority groups, the subjects for this study were not selected on the basis of race, religion, or national origin, although foreign students were omitted. Adequate records were available for only 99 of these students who were split into the two subgroups.* The first subgroup contained those students admitted with a grade point average below 2.5, while the second subgroup included those students whose grade point averages were below individual department standards (which were never below a 2.5 gpa; thus the second subgroup contains the first subgroup).

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*Since all departments maintained a gpa standard of at least 2.5, the "below 2.5 groups" of the first three hypotheses are included in the "below departmental standards groups" of the latter three hypotheses.

The total group of students was also subdivided into college and department categories for hypothesis testing. However, since only six colleges had admitted fifteen or more exceptional students and only five departments had admitted five or more exceptional students, only colleges and departments which had at least these numbers were compared.

Stratified random samples by college and department were then drawn of those new admits, appearing on the same summer and fall rosters, whose upper division grade point averages were above all department admissions criteria. These students comprised the control group. A sample of 115 such control students who met their department requirements were randomly drawn. The sampling plan was to include enough students within each college and department for meaningful comparisons. With the 99 "experimental" students, the total number of subjects originally identified for the study was 214.

Instrumentation

The instrument was an investigator-designed questionnaire, modified from the Graduate School's Recommendation Report on the "Applicant for Admission" form (see Appendix A). It included the student's name, a section for the faculty member to indicate his degree of familiarity with the student to be evaluated, and eleven items relating to the student's personality and performance as a graduate student. (A twelfth item asked whether, in the opinion of the faculty member, the University had erred in admitting the student identified on the questionnaire.)

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*There were eleven students who applied for exceptional admission, were accepted, but did not appear to begin their graduate work.

The eleven items concerned such areas as the student's knowledge of and ability to use the basic research techniques in his field, his self-reliance and independenec in scholarly work, his motivation toward scholarly work, his emotional stability and maturity, and his skill in expressing himself—both in speech and writing.

Faculty members were asked to rank the students in comparison to other recent graduate students, at the same stage in their programs, who had worked on equivalent degrees in that department. A brief item-statement, e.g., "mastery of the fundamental knowledge in his major field," was presented and then followed by a nine-interval percentile scale. The scale ranged from the bottom tenth percentile to the top tenth percentile with a twenty percentile (41-60) midpoint. Based upon his familiarity with the student, the faculty member was asked to check a percentile for each item which, in his judgment, best described that student.

The questionnaire required only a few minutes to fill out and most returns were complete. In all, 428 copies of the instrument (2 for each of the 214 students) were circulated to selected faculty members who were most familiar with the students in the study. The faculty members were considered "most familiar" if they had been advisors to the students and/or had instructed them in one or more classes. Faculty members were not told the specific purpose of the study or which students had been exceptionally admitted.

Utilizing data collection techniques designed by Leslie,[22] 395 questionnaires (92 percent) were returned. Of these, 346 (81 percent) contained usable data. For most students there were two usable responses, but for the others only one questionnaire was returned. At this point data were available for 74 experimental subjects (below department requirements) and 111 control subjects (above all requirements)—185 subjects in all. The data were then compared according to the six hypotheses.

The plan for data analysis was designed to provide the graduate school and appropriate faculty committee with the information necessary for evaluation and decision making. Implicit in the charge to the graduate dean was the assumption that students admitted as exceptions in any given year would not differ markedly from those of subsequent years; thus, the true population sampled extended beyond the 1970 summer and fall terms. Therefore, the use of inferential statistics was deemed appropriate—the inference being applied to future exceptionally admitted students. At the same time the most noteworthy findings are the simple comparisons of raw data in the forms of means and standard deviations. This is so because the magnitude of differences between regular students and exceptionally admitted students is far more important than whether or not some difference exists.

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[22] Larry L. Leslie, "Obtaining Response Rates to Long Questionnaires," *Journal of Educational Research* (1970): 345-50.

Results

When the mean scores for the below 2.5 exceptional admissions students were compared with those of the traditional admits, the traditionals had higher scores on ten of the eleven items (see pages 2 and 3 of Appendix A). The differences ranged from .03 to .60 (with an average of .28). The exceptionally admitted students' single higher mean score was higher by a difference of .16 on Item 8.

As a total group, the mean scores for the exceptional admissions students were not lower than those of the traditional admits by more than .30 on eight of the eleven items—a small difference on a one-to-ten scale. As a matter of fact, on two of the eleven items (nos. 8 and 9) the mean scores for the exceptional admits were higher than those of the traditionally admitted students (see Table 1). On the single item (#2) which had a difference greater than .30, the variance was only .52. Since standard deviations were of the order of 2.0, these differences were small indeed.

The differences within departments varied more than those between the two major groups taken totally. Departments I and V contributed no subjects (missing returns) for the comparison of below 2.5 experimental students with the control group. Department II favored the regularly admitted students on seven items with mean score differences ranging from .43 to 2.18. The four items favoring the experimentals had differences ranging from .03 to .53. Departments III and IV had an insufficient number of observations for valid calculations. However, in department VI, the combined "all other departments" category, the exceptionally admitted students

TABLE 1

MEANS AND STANDARD DEVIATIONS FOR THE ELEVEN ITEMS BY THE EXPERIMENTAL SUB-GROUP AND THE CONTROL GROUP (HYPOTHESES 1 and 4)

	(Below 2.5) X_1	N = 90	(Below dept. standards) X_2	N = 148	(Regular admits) Control	N = 222
Items*	Means	SD	Means	SD	Means	SD
1	5.95	2.04	6.04	2.11	6.34	1.92
2	5.44	1.99	5.52	2.16	6.04	1.94
3	5.88	2.18	6.02	2.27	6.22	2.00
4	6.37	2.21	6.35	2.24	6.60	1.98
5	6.47	2.04	6.41	2.14	6.66	1.97
6	6.74	1.72	6.65	1.93	6.84	1.90
7	5.95	2.05	6.07	2.04	6.35	2.01
8	6.82	1.93	6.90	1.81	6.66	1.96
9	6.52	1.79	6.59	1.75	6.55	2.00
10	6.22	2.07	6.27	2.03	6.29	2.02
11	6.22	2.25	6.37	2.25	6.63	2.13

*Items are identified in Appendix A.

were favored on seven of the eleven items with a range of .03 to .36. The four items favoring the control group ranged from .01 to .30. These are extremely small differences.

When the two subgroups of experimentals were combined for a within-department comparison, the results were generally the same as those found when the below 2.5s were taken separately. The controls were favored somewhat in most distinct departments while the experimentals predominated in the combined "other departments" category. Both differences spanned a small range somewhat like the university-wide comparison. Department IV, however, showed a dramatic switch when the total group of experimentals (as opposed to the below 2.5s only) were compared with the controls. In the former instance there was a 9:2 ratio favoring the controls, while in the latter case an 8:3 ratio favored the experimentals although with a much smaller range of differences (see Table 2).

The within-college differences between the below 2.5 experimentals and the controls disclose some interesting findings. Colleges III (10:1 ratio) and VI (8:3) decisively favored the controls. Colleges IV (11:0) and V (9:2) favored the experimentals. And Colleges I (6:5) and II (7:4), although favoring the controls, were more equally balanced. The number of subjects for the experimental group was too small to consider for college VII, the "other departments" category. Taking the eleven items for the six colleges for a total of sixty-six comparisons, interestingly enough, resulted in thirty-three favoring the controls and thirty-three favoring the experimentals.

When the two subgroups of experimentals were combined for a within-college comparison, five of the colleges remained essentially the same. Only college I changed from a 6:5 ratio, favoring the controls to a 11:0 ratio in the same direction (see Table 3).

Summary

Essentially there were few differences between the groups when compared on a university-wide basis. Some small differences favored the controls within colleges, while a greater number of differences with a wider range of variance favored the controls within departments. In light of these findings the remainder of the analysis is expected to add very little. Exceptionally admitted students do not appear to differ importantly from traditional students in the perceptions of faculty members who know them best. In order to determine whether these differences in the mean scores are greater than could be expected by chance, the data were subjected to t-tests under the six hypotheses.

The t-Tests

As expected when appraising mean scores, the t-tests of the six hypotheses on the eleven items of the instrument resulted in few significant differences between the experimental students (divided into the two subgroups of those admitted below the previous university-wide minimum of a 2.5 gpa in the junior-senior years of undergraduate education and those admitted who were below particular department requirements) and the controls (those admitted above the 2.5 average and all other particular minimum department criteria).

TABLE 2

MEANS AND STANDARD DEVIATIONS FOR THE ELEVEN ITEMS BY THE EXPERIMENTAL SUBGROUPS AND THE CONTROL GROUP (HYPOTHESES 2 and 5)

	DEPARTMENT II**				DEPARTMENT VI**				DEPARTMENT II***			
	X_1	N = 12	C	N = 38	X_1	N = 74	C	N = 108	X_2	N = 12	C	N = 38
Items*	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
1	5.00	2.30	5.97	2.48	6.16	1.97	6.12	2.01	5.00	2.30	5.97	2.48
2	3.50	1.85	5.41	2.41	5.67	1.95	5.97	2.04	3.50	1.85	5.41	2.41
3	3.75	2.12	5.93	2.38	6.08	2.10	6.00	2.02	3.75	2.12	5.93	2.38
4	5.50	2.50	6.22	2.40	6.53	2.20	6.41	2.04	5.50	2.50	6.22	2.40
5	6.00	1.76	6.43	2.35	6.57	2.11	6.59	2.07	6.00	1.76	6.43	2.35
6	6.50	1.83	6.47	2.10	6.83	1.73	6.84	2.05	6.50	1.83	6.47	2.10
7	4.90	2.13	5.81	2.57	6.12	2.06	6.13	2.09	4.90	2.13	5.81	2.57
8	6.14	2.91	5.79	2.73	6.97	1.84	6.61	1.84	6.14	2.91	5.79	2.73
9	6.45	1.86	6.05	2.63	6.60	1.81	6.35	2.02	6.45	1.86	6.05	2.63
10	6.10	2.13	5.57	2.42	6.26	2.12	6.23	2.07	6.10	2.13	5.57	2.42
11	5.30	2.66	6.08	2.36	6.39	2.22	6.36	2.32	5.30	2.66	6.08	2.36

TABLE 2 (cont.)

	DEPARTMENT III***				DEPARTMENT V***				DEPARTMENT VI***			
	X_2	N = 12	C	N = 18	X_2	N = 10	C	N = 18	X_2	N = 102	C	N = 108
Items	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	5.91	1.24	6.29	0.98	5.80	2.29	6.88	1.27	6.18	2.16	6.12	2.01
2	5.18	1.07	5.41	0.87	2.83	1.16	5.86	1.45	5.76	2.14	5.97	2.04
3	5.66	1.82	5.31	0.94	6.20	2.39	6.27	1.31	6.11	2.26	6.00	2.02
4	5.54	1.69	6.05	1.39	6.10	2.23	7.00	1.41	6.52	2.27	6.41	2.04
5	5.41	1.67	6.11	1.49	6.77	1.64	6.61	1.50	6.44	2.27	6.53	2.07
6	5.09	1.13	6.05	1.56	6.70	1.49	7.16	1.38	6.81	1.99	6.84	2.05
7	5.16	1.26	6.17	1.01	6.00	2.16	7.00	1.00	6.23	2.08	6.13	2.09
8	5.80	1.68	5.58	1.66	6.90	1.91	7.12	1.02	7.05	1.75	6.61	1.84
9	5.16	1.03	5.88	1.36	6.40	2.06	7.16	0.92	6.76	1.74	6.35	2.02
10	5.81	1.66	6.00	1.19	6.80	1.61	6.76	1.30	6.19	2.14	6.23	2.07
11	5.72	1.61	6.18	1.51	5.77	2.29	7.82	1.01	6.53	2.25	6.36	2.32

*Items are listed in Appendix A.

**Departments I & V had no observations for the experimental subgroup. Departments III and IV had insufficient observations for the experimental subgroup of Hypothesis II.

***Departments I and IV had insufficient observations for the experimental subgroup of Hypothesis V.

TABLE 3

MEANS AND STANDARD DEVIATIONS ON THE ELEVEN ITEMS FOR EXPERIMENTAL SUBGROUPS AND THE CONTROL GROUP BY COLLEGES: (HYPOTHESES 3 and 4*)

	COLLEGE I						COLLEGE II						COLLEGE III					
	X_1	N = 4	X_2	N = 12	C	N = 34	X_1	N = 12	X_2	N = 12	C	N = 38	X_1	N = 16	X_2	N = 40	C	N = 36
Items	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD	$\overline{X}$	SD
1	7.75	0.50	6.75	1.65	7.05	1.55	5.00	2.30	5.00	2.30	5.97	2.48	6.18	1.16	6.10	1.69	6.72	1.34
2	6.00	3.46	6.00	2.32	7.17	1.54	3.50	1.85	3.50	1.85	5.41	2.41	5.56	1.20	5.25	1.82	5.91	1.41
3	7.75	0.95	6.25	2.17	7.26	1.54	3.75	3.13	3.75	2.12	5.93	2.38	5.87	1.20	6.12	1.78	6.00	1.44
4	6.00	2.64	5.63	2.24	7.26	1.69	5.50	3.50	5.50	2.50	6.22	2.40	6.43	1.59	6.30	1.88	6.67	1.41
5	5.33	3.05	5.27	2.05	7.23	1.67	6.00	1.76	6.00	1.76	6.43	2.35	6.43	1.75	6.43	1.77	6.72	1.58
6	7.50	1.29	6.83	1.69	7.41	1.49	6.50	1.83	6.50	1.83	6.47	2.10	6.75	1.48	6.48	1.68	7.03	1.53
7	6.50	1.73	6.08	1.88	7.17	1.52	4.90	2.13	4.90	2.13	5.81	2.57	5.87	1.50	5.97	1.76	6.75	1.31
8	8.00	1.41	7.10	1.19	7.15	1.62	6.14	2.91	6.14	2.91	5.79	2.73	7.12	1.20	6.86	1.56	6.73	1.65
9	7.50	1.29	7.00	1.70	7.26	1.74	6.45	1.86	6.45	1.86	6.05	2.63	6.62	1.40	6.40	1.70	6.76	1.36
10	4.00	0.00	6.28	1.70	7.00	1.35	6.10	2.13	6.10	2.13	5.57	2.42	6.37	1.36	6.48	1.51	6.51	1.27
11	7.00	1.41	6.66	1.96	7.10	1.60	5.30	2.66	5.30	2.66	6.08	2.36	6.43	1.50	6.34	1.84	7.15	1.44

TABLE 3 (cont.)

	COLLEGE IV						COLLEGE V						COLLEGE VI					
	X_1	N = 10	X_2	N = 10	C	N = 30	X_1	N = 14	X_2	N = 30	C	N = 36	X_1	N = 14	X_2	N = 20	C	N = 26
Items	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
1	6.30	2.40	6.30	2.40	5.80	2.09	6.14	2.31	6.63	2.15	6.06	1.91	6.07	1.77	5.45	2.50	6.07	2.03
2	6.30	1.82	6.30	1.82	5.70	2.13	6.21	2.11	6.50	2.17	6.08	1.86	5.78	1.76	5.20	2.39	5.95	2.10
3	6.50	2.50	6.50	2.50	5.41	2.39	6.64	2.02	7.06	1.76	6.44	2.07	5.58	2.10	5.00	2.65	6.23	2.07
4	7.50	1.50	7.50	1.50	5.75	2.48	6.92	1.94	7.06	1.96	6.86	1.82	6.58	2.31	5.88	2.75	6.66	2.11
5	7.10	2.28	7.10	2.28	5.71	2.47	7.00	1.22	7.14	1.86	6.77	1.89	6.25	2.37	5.55	2.89	6.94	1.80
6	6.60	1.57	6.60	1.57	6.34	2.45	7.38	1.19	7.32	1.63	6.91	1.78	7.00	2.00	6.00	2.82	6.61	2.30
7	6.10	2.28	6.10	2.28	5.31	2.45	6.71	1.93	6.86	1.85	6.41	1.90	6.07	1.77	6.00	2.05	6.34	2.03
8	6.50	2.50	6.50	2.50	6.24	2.11	6.92	1.63	7.30	1.51	7.36	1.38	7.33	1.77	6.94	1.83	6.21	2.04
9	6.20	2.25	6.20	2.25	5.86	2.08	6.78	1.80	7.06	1.52	6.58	1.96	7.00	1.46	6.95	1.53	6.62	2.20
10	6.60	2.54	6.60	2.54	5.51	2.73	6.76	1.78	6.76	1.66	6.53	2.09	6.08	2.46	5.50	2.83	6.72	1.87
11	6.20	2.82	6.20	2.82	5.60	2.69	6.61	2.06	7.03	1.97	6.82	2.09	6.28	2.19	5.89	2.66	7.25	1.99

*College VII had insufficient observations for the control group.

Though a few differences were found, the number of these was not much more than that expected by probability. Also, recall that even where differences were significant, the magnitude of those differences was small. (See Appendix B for a discussion of t-test findings.) The differences for the subgroup of below 2.5 students and the regular students were also small (see Table 1).

Factor Analysis

The next step in analyzing the data was to perform a factor analysis on the responses to the eleven items in order to increase interpretability of the instrument. The factor analysis revealed that all eleven items were measuring essentially the same thing and therefore that the instrument was unidimensional.* Hence, comparison of groups on the single factor greatly simplifies interpretation of the findings with little apparent loss of sensitivity.

Standardized group mean scores on the composite factor were compared using t-tests according to the six hypotheses. No significant differences were found. Detailed findings are presented in Appendix C.

The most informative results revealed that exceptionally admitted students were perceived by knowledgeable faculty to be approximately equal in ability and achievement to regularly admitted students. Raw mean scores on each of the eleven items of the rating instrument, statistical tests of the means of the eleven items, and statistical tests of standardized group mean factor scores indicated near-equal appraisals of both kinds of students. This was true for the University as a whole and for individual colleges and departments considered separately.

Conclusions

On the basis of this study the changes in graduate admissions policies at The Pennsylvania State University do not appear to adversely affect the quality of graduate programs. Since the new procedures specify the departments as the admitting units and the differences between the experimentals and controls were indeed small, it would suggest that the departments are capable of selecting students who, though failing to meet certain department standards, nonetheless perform acceptably in the programs. Even where there is some evidence that exceptionally admitted students are perceived less favorably by faculty members, the differences are so small that they are almost negligible. Therefore, the evidence suggests continuation of the new policy.

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*A single factor, with an eigenvalue of 8.97 and factor loadings all above .83, explained 81.55 percent of the total variance. A second factor explained only an additional 5.53 percent of the variance with an eigenvalue well below 1.0-.61. (See Table 6, Appendix B.)

To be sure, faculty perceptions are but one criterion for assessing graduate students' capabilities and achievements. Nevertheless, since it is ultimately the faculty who largely determine the success or failure of graduate students—and usually by some equally subjective judgments—faculty perceptions are valid measures. As time passes and other criteria become available, more complete appraisals of the change in graduate admissions procedures at The Pennsylvania State University will become possible. For example, grades earned in courses, success in comprehensive examinations, and success in completing degree programs will be valuable indexes of success. Follow-up studies of graduates could yield even more valid evaluations. For the time being, however, faculty views suffice.

Perhaps, if the results of this study were internally conflicting or were at odds with published accounts of similar investigations, the single criterion of faculty appraisal would arouse more skepticism. However, both the internal consistency of the findings and the consistency with previous research are clearly compatible. From this and previous research, success in graduate study does not appear to be predictable from undergraduate grade point averages, nor does it appear to be predictable on the basis of other standard criteria used by the respective departments of the University. Even when differences do favor the regularly admitted student over the exceptionally admitted, the size of the advantage is exceedingly small.

Traditional graduate admissions policies do not appear to serve their ostensible purposes. They do not seem to afford substantial efficiencies to society by restricting graduate education to those most likely to benefit. Perhaps they do, or at least historically did, however, restrict persons from certain social, racial, or economic backgrounds. It would appear that institutions of higher education are coming to that conclusion. In the absence of some otherwise compelling evidence, equal consideration of all applicants would seem to be a wise policy.

APPENDIX A:

Questionnaire Letter and Questionnaire

THE PENNSYLVANIA STATE UNIVERSITY
CENTER FOR THE STUDY OF HIGHER EDUCATION
101 RACKLEY BUILDING
UNIVERSITY PARK, PENNSYLVANIA 16802

Area Code 814
865-6346

January 11, 1971

Dear Faculty Member:

We need your help in fulfilling a charge given to the Graduate School by the Graduate Admissions Committee. Our concern has to do with the relative success that certain student typologies encounter as graduate students as Penn State.

Would you, therefore, please complete the enclosed form(s) for the student(s) indicated at the top of the form? No more than five minutes should be necessary to complete each instrument.

Thank you.

James B. Bartoo
Dean of the Graduate School

Larry L. Leslie
R Research Associate
Center for the Study of
Higher Education

JBB/LLL/fz
Enclosure

STUDENT EVALUATION FORM

1.-3. Students. Name ____

7. How familiar are you with this student's academic performance (as a graduate student at Penn State) or other characteristics that you believe are important to his status as a graduate student?

   1. Almost totally unfamiliar ______
   2. Vaguely familiar ______
   3. Modestly familiar ______
   4. Quite familiar ______
   5. Very familiar ______

INSTRUCTIONS: Rank this student in comparison to other recent graduate students (at the same stage in the program) who have worked on equivalent degrees in your department. Rank him by checking the percentile within which he falls.

	Bottom 10%	11th-20th %ile	21st-30th %ile	31st-40th %ile	41st-60th %ile	61st-70th %ile	71st-80th %ile	81st-90th %ile	Top 10%
11. Mastery of the fundamental knowledge in his major field.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
12. Knowledge of and ability to use the basic research techniques in his field.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
13. A fertile imagination and originality in his field.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
14. Self-reliance and independence in scholarly work.	___ 1 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
15. Motivation toward productive scholarly work.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
16. Emotional stability and maturity.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
17. How do you rate him in General All-around Scholarly Ability.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
18. How well he interacts with his fellow students.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
19. Skill in expressing himself in speech and writing.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
20. Development since you have known him.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
21. Performance in your class.	___ 1	___ 2	___ 3	___ 4	___ 5	___ 6	___ 7	___ 8	___ 9
22. Did we err in admitting him.	___ Yes	___ No							

COMMENTS:

Your Signature

APPENDIX B:

Discussion of t-test Findings

The investigators hesitate to present these t-test findings for fear that they will be misinterpreted. The reader is advised to remember that although some significant differences were found for the two general groups, the magnitude of the differences was very small—exceeding .30 on a 1.0 to 10.0 scale on only one of eleven items. The large number of subjects caused findings to be statistically significant even though differences were small. The reader is asked to keep these points in mind.

For hypothesis 1, calling for a comparison of the below 2.5 experimental subjects with the traditional control subjects, significant differences ($.010 < P < .025$) were found on only one item, "knowledge of and ability to use the basic research techniques in his field." The mean score for the regular students was higher.

Hypothesis 2 compared the below 2.5 subjects with the control subjects after both groups had been categorized by department. With minor exceptions, the differences within departments between these two groups were not found to be significant. The differences between the below 2.5 gpa students and the traditionally admitted students by department revealed that "a knowledge of and ability to use basic research techniques in his field" ($.025 < P < .050$) and "imagination and originality in his field" ($.010 < P < .025$) were the only two items on which significant differences were found—and these in only one department. Another three departments showed no significant differences on any of the items, while the two other departments did not contain adequate numbers of subjects for testing.

When categorized by colleges to test hypothesis 3 (the below 2.5 experimentals with the controls), only college II had items (two) on which group differences were significant. Mean scores again favored the regular students. These items were the same two, "knowledge of and ability to use basic research techniques in his field" ($.025 < P < .050$) and "imagination and originality in his field" ($.010 < P < .025$). Differences significantly favored regular students on the item, "All-around scholastic ability" ($.025 < P < .050$) in college III. On "self-reliance and independence in scholarly work" mean scores favored the exceptionally admitted students ($.025 < P < .050$) in college IV. Colleges V and VI revealed no significant differences between groups, and college VII had inadequate numbers for testing (see Table 4). The sum of significant t-values approximated that

TABLE 4

SIGNIFICANT AND NONSIGNIFICANT t VALUES FOR THE ELEVEN ITEMS BY EXPERIMENTAL AND CONTROL GROUPS ON THE SIX HYPOTHESES

Items	Hypothesis 1 University Wide	Hypothesis 2 Department						Hypothesis 3 College						
		I	II	III	IV	V	VI	I	II	III	IV	V	VI	VII
1	NON	N/T	NON	NON	SIG	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
2	SIG	N/T	SIG	NON	NON	N/T	NON	N/T	SIG	NON	NON	NON	NON	N/T
3	NON	N/T	SIG	NON	NON	N/T	NON	N/T	SIG	NON	NON	NON	NON	N/T
4	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	SIG	NON	NON	N/T
5	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
6	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
7	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	SIG	NON	NON	NON	N/T
8	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
9	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
10	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T
11	NON	N/T	NON	NON	NON	N/T	NON	N/T	NON	NON	NON	NON	NON	N/T

Items	Hypothesis 4 University Wide	Hypothesis 5 Department						Hypothesis 6 College						
		I	II	III	IV	V	VI	I	II	III	IV	V	VI	VII
1	NON	N/T	NON	NON	N/T	NON	NON	NON	NON	SIG	NON	NON	NON	N/T
2	SIG	N/T	SIG	NON	N/T	SIG	NON	NON	SIG	NON	NON	NON	NON	N/T
3	NON	N/T	SIG	NON	N/T	NON	NON	NON	SIG	NON	NON	NON	NON	N/T
4	NON	N/T	NON	NON	N/T	NON	NON	SIG	NON	NON	SIG	NON	NON	N/T

TABLE 4 (cont.)

Item	Hypothesis 4 University Wide	Hypothesis 5 Department I	II	III	IV	V	VI	Hypothesis 6 College I	II	III	IV	V	VI	VII
5	NON	N/T	NON	NON	N/T	NON	NON	SIG	NON	NON	NON	NON	NON	N/T
6	NON	N/T	NON	NON	N/T	NON	NON	NON	NON	NON	NON	NON	NON	N/T
7	NON	N/T	NON	SIG	N/T	NON	NON	NON	NON	SIG	NON	NON	NON	N/T
8	NON	N/T	NON	NON	N/T	NON	NON	NON	NON	NON	NON	NON	NON	N/T
9	NON	N/T	NON	NON	N/T	NON	NON	NON	NON	NON	NON	NON	NON	N/T
10	NON	N/T	NON	NON	N/T	NON	NON	NON	NON	NON	NON	NON	NON	N/T
11	NON	N/T	NON	NON	N/T	SIG	NON	NON	NON	SIG	NON	NON	NON	N/T

HYPOTHESES:

1. There are no differences in student performance between students who are admitted to graduate programs with less than a 2.5 gpa in their junior-senior undergraduate years and those who are admitted with greater than a 2.5 gpa.
2. There are no differences within departments in student performance between students who are admitted to graduate programs with less than 2.5 gpa's in their junior-senior years and those who are admitted with greater than 2.5 gpa's.
3. There are no differences within colleges in student performance between students who are admitted to graduate programs with less than 2.5 gpa's in their junior-senior years and those who are admitted with greater than 2.5 gpa's.
4. There are no differences in student performance between students who are admitted to graduate programs on the basis of special exceptions to department admissions standards and those who are not special exceptions to department standards.
5. There are no differences within departments in student performance between students who are admitted to graduate programs on the basis of special exceptions to department admissions standards and those who are not special exceptions to department standards.
6. There are no differences within colleges in student performance between students who are admitted to graduate programs on the basis of special exceptions to department standards.

SIG = Significant at $p \leq .05$

NON = Not Significant

N/T = Not Tested: Insufficient Number of Observations

*See Appendix A, pp. 2 & 3.

which could be expected by probability for this number of t-tests performed at this level of significance.

The next three hypotheses compared the entire group of experimental subjects (both below 2.5 gpa's and above 2.5 but below particular department criteria) with the control subjects (above all particular department requirements). Hypothesis 4 compared the experimentals and controls as complete groups again as in hypothesis 1. In this instance only one item, "a knowledge of and ability to use the basic research techniques in his field," revealed significant differences ($.010 < P < .025$) between the groups. The direction of the difference favored the control subjects.

Hypothesis 5 tested the same experimental and control groups categorized by departments. Two departments showed significant group differences on two of the eleven items and two other departments disclosed one statistically significant item. Differences favored the control group in all four cases. "A knowledge of and ability to use the basic research techniques in his field" ($.025 < P < .050$) and a "fertile imagination and originality in his field" ($.010 < P < .025$) were the significant items for department II. "General all-around scholarly ability" ($.010 < P < .025$) was the only item yielding significant differences for the groups within department III. The experimental and control groups differed significantly on "basic research techniques" ($.001 < P < .010$) and "class performance" ($.001 < P < .010$) in department V.

The t-tests of hypothesis 6, measuring the differences within colleges between the two subgroups of the experimental group taken together and the total control group, revealed three items on which the groups were significantly different in college III: "mastery of fundamental knowledge" ($.025 < P < .050$), "general all-around scholarly ability" ($.010 < P < .025$), and "class performance" ($.010 < P < .025$). Two different items revealed differences in colleges I and II. In college I group differences were significant on "self-reliance and independence in scholarly work" ($.010 < P < .025$) and "motivation toward productive scholarly work" ($.001 < P < .010$). In college II "basic research techniques" ($.025 < P < .050$) and "imagination and originality in his field" ($.010 < P < .025$) were the items of significance. The results of the t-tests for college IV revealed significant differences for only one item, i.e., "self-reliance and independence in scholarly work" ($.025 < P < .050$). In only this last case did the experimental group have a higher score. In colleges V and VI group differences were not significant on any items, and the differences within college VII were not compared because of inadequate numbers of subjects for testing.

For the most part, then, an analysis of the raw data resulted in relatively few significant differences in the performances of the two groups of students as rated by faculty—regardless of how the experimental students were grouped. However, even the differences that do exist are for the most part inconsequential, due to their small magnitude.

APPENDIX C:

Discussion of Factor Analysis

A factor analysis "summarizes" data. It collapses responses to the items of an instrument or those of several instruments. This can result in the need to consider only a few findings rather than many, possibly contradictory findings (as found above). These "summarized" results follow.

Hypothesis 1 tested the differences between the experimental subjects with less than a 2.5 grade point average against the control subjects, who were all above 2.5 and any other particular department requirements. The t value was 0.720 and was not significant.

The second hypothesis compared the same groups (experimental subjects below 2.5 with control subjects above all particular requirements) categorizing them by departments. However, due to the small numbers of experimental subjects, the t-tests were not computed for five departments. Therefore, only their means and standard errors are reported in Table 5. The sixth category, "all other departments combined," had adequate numbers of subjects and was tested, resulting in a t value of –0.674, which was not significant.

For hypothesis 3, measuring the below 2.5 experimental subjects against the entire control group by colleges, the differences within colleges were tested. Five of the seven college categories contained adequate numbers for testing. (See Table 5 for means and standard errors of the other two colleges.) The t value for college II was 1.310, which was not statistically significant. The t value for college III was 1.021 and was not significant. College IV revealed a t of –.0986, which was not significant. The t value for college V was found to be –0.182, not significant; and the t value for college VI was –0.083 and was also not significant.

Without any subdivision, hypothesis 4 compared the experimentals and controls with each other as complete groups. The t value was 1.028; it was not significant.

For hypothesis 5, the two major groups were again categorized by departments, and, where the number of subjects was adequate, t-tests were performed. Four of the six departments were so tested. (See Table 5 for the means and standard errors of the other two departments whose numbers were inadequate.) The t value for department II was 1.310, which was not significant. For department

TABLE 5

COMPOSITE FACTOR MEANS AND STANDARD ERRORS SQUARED FOR ALL GROUPS

	University Wide			Departments I			Departments II			Departments III		
	$X_1N=82$	$X_2N=140$	C N = 198	$X_1N=3$	$X_2N=6$	C N = 20	$X_1N=9$	$X_2N=9$	C N = 37	$X_1N=2$	$X_2N=11$	C N = 16
Mean	–0.52	–0.73	0.36	0.00	–0.16	0.63	–0.70	–0.70	–0.21	–0.61	–0.50	–0.19
Standard Error Squared	0.10	0.69	0.45	0.00	0.15	0.16	0.97	0.97	0.40	0.13	0.40	0.11

	Departments IV			Departments V			Departments VI		
	$X_1N=2$	$X_2N=6$	C N = 18	$X_1N=3$	$X_2N=10$	C N = 18	$X_1N=69$	$X_2N=98$	C N = 89
Mean	–0.22	0.58	0.30	0.00	–0.16	0.25	0.53	0.72	–0.49
Standard Error Squared	0.92	0.80	0.36	0.00	0.90	0.15	0.12	0.10	0.10

	Colleges I			Colleges II			Colleges III			Colleges IV		
	$X_1N=3$	$X_2N=11$	C N = 34	$X_1N=9$	$X_2N=9$	C N = 37	$X_1N=16$	$X_2N=39$	C N = 54	$X_1N=10$	$X_1N=10$	C N = 29
Mean	0.12	–0.67	0.41	–0.70	–0.70	–0.21	–0.37	–0.86	0.15	0.68	0.68	–0.36
Standard Error Squared	0.25	0.62	0.14	0.97	0.97	0.40	0.27	0.16	0.66	0.14	0.14	0.47

TABLE 5 (cont.)

	Colleges								
	V			VI			VII		
	$X_1 N = 14$	$X_2 N = 29$	C N = 28	$X_1 N = 12$	$X_2 N = 18$	C N = 14	$X_1 N = 18$	$X_2 N = 24$	C N = 2
Mean	0.17	0.29	0.12	0.34	–0.26	0.23	–0.76	–0.17	–0.66
Standard Error Squared	0.51	0.25	0.31	0.92	0.83	0.61	0.58	0.54	0.00

TABLE 6

ITEM FACTOR LOADINGS
(EIGENVALUE 8.97040)

Item	Factor Loading
1	0.89655
2	0.90892
3	0.91736
4	0.92905
5	0.87848
6	0.88771
7	0.94491
8	0.83299
9	0.85615
10	0.93629
11	0.93791

II was 1.310, which was not significant. For department III it was 1.375 and was nonsignificant. Department V showed a t value of 1.295 and was not significant, while department VI disclosed a t value of -0.390, also not significant.

Hypothesis 6 compared the two complete groups categorized by colleges. Only one of the seven colleges did not provide enough data for testing. Means and standard errors are reported in Table 6. The t value for college I was 1.740 and was not significant. For college II it was a nonsignificant value of 1.310. College III reported a 1.555 t, not significant. College IV's results were a t value of –0.986 which was not significant. The difference for college V was not significant with a t value of -0.703; and differences within college VI, with a t value of 0.712, were likewise nonsignificant. Overall, there appeared to be no marked differences on any of the six hypotheses using either raw data or the composite factor.

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THE RATIONALE FOR VARIOUS PLANS FOR FUNDING AMERICAN HIGHER EDUCATION*

Larry L. Leslie

I understand my assignment to be to discuss with you the question of access to higher education, with regard to the rationale for various plans for financing students in higher education and the rationale for various plans for financing higher education institutions themselves. Obviously, these topics are related. My approach will be to focus on finance, using this as the primary medium, but I will draw the implications to access as I move along. This approach seems to make sense because access issues are tied very closely to finance. Indeed, the access question is clearly at the root of the present debate over how higher education should gain its fiscal support. To illustrate, it has been argued that if we should decide to opt for the student voucher system, many problems of equal access would be automatically resolved.

Background

I will begin by briefly setting the stage. Here I will provide the background for the current and future task of financing higher education, including how the present higher education bill is being paid. Second—and this will be the heart of my statement—I will discuss the various current plans for funding higher education, including the rationale for these plans. Obviously, the access question will surface in this second section. Third, although this is not part of my charge and therefore I may be foolish to attempt it, I shall try to make some conclusions.

"Setting the stage" seems to be absolutely essential to this discussion. One can hardly talk about plans for changing the present system of financing higher education without first talking about what is. Thus, this first part of my statement deals with the present and projected costs of higher education, which of course must consider enrollment patterns and projections. Surely it must also include the magnitude of the present financial crisis—if indeed there is such a crisis. And it must include how the *present* bill is being paid. Although this last inclusion might appear gratuitous, a considerable number of proposals appear to be ignorant about who is presently underwriting the higher education system.

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First, then, how much are we now spending? In 1970-71, total expenditures for higher education were $24.2 billion. This year we will spend almost 10 percent more, or $26.5 billion. The National Center for Educational Statistics tells us that by the 1980-81 academic year, we will be spending $43.8 billion. These are the latest figures and they are considered to be quite reliable.

During the past two years, state expenditures for public higher education have increased at the rate of 26 percent—a rather healthy increase, at least so it would appear on the surface. Twenty-six percent for two years or a 13 percent increase for each of the past two years would *seem* to be wholly adequate. And yet the present state of American Higher Education has been described as one of crisis. How can this be? A Brookings Institution study for the Carnegie Commission showed that per student costs necessarily increase 3 percent per year plus inflation—or, about a minimum of 6.4 percent per year per student at the present rate of inflation. The National Association of State Universities and Land-Grant Colleges puts the comparable figure at 10 percent per year. Note that this is to maintain a standstill status. Also note that these figures were increases *per student.* During the past 2 years, when the 26 percent expenditure increase was occurring, student enrollments were up 17 percent. Therefore, simple arithmetic reveals that the 26 percent "increase" represents, in fact, roughly a 2 or 3 percent decrease in terms of dollars per student needed in order to maintain a standstill status. Further, some types of institutions fared considerably better than others, thus inflating the figures for the less fortunate. State universities, and to a lesser extent, state colleges were among the less fortunate. Only community colleges generally appear to have fared well.

All this is by way of pointing out the absolute necessity of assessing our financial condition in light of enrollment increases. There is no way to completely "hold the line" in the financing of higher education. Any state legislature which "holds the line" is in fact significantly cutting the budget in terms of present dollars. This is true even if enrollments were to stay the same—something that is not likely to happen in any state.

What, then, *does* the future hold regarding enrollment patterns? The 1970 enrollments were 7.9 million. Freshmen enrollments last fall were up 12 percent over the levels of the fall of 1969. They have risen commensurately for ten years. Whether this trend will continue is another question. The business of making enrollment projections is a sticky business indeed. The Census Bureau for example estimates that college enrollments by the year 2000 will be between 9.3 million and 19 million—an error term of over 100 percent. The wide range is attributed to such factors as: changing societal attitudes toward education, the amount of financial support that will be available to students, the growth of community colleges, changes in admissions practices, and perhaps most important of all, changing fertility rates. The lower projection of 9.3 million is based upon the October 1970 percentage of the population between the ages of five and thirty-four attending some educational institution, while the higher figure is an extrapolation of the same percentage increases that occurred between 1950 and 1970.

Obviously, the 9.3 million to 19 million range is too wide to be of much use. Therefore, *considering all factors, the National Center for Educational Statistics predicts college enrollments of 13.3 million by 1980.* The Center predicts a 70 percent enrollment increase in the public sector and an 8 percent increase in the private sector. Thus, in 1980, there would be 11 million students in public higher education and 2.3 million in private higher education. Again, the 1970 enrollments were 7.9 million. In short, most everyone agrees that enrollments will go up; the only question is by how much.

This brings us back to whether indeed there is or at least, will be, a financial crisis in higher education. My mere presence on this platform indicates that there is at least a perception of such a crisis in the minds of some.

I should at least mention, however, that the majority of the economists who are studying higher education do not perceive any crisis at all. It is interesting, although not very informative, to listen to the bantering going on between the two groups of economists.

There is little doubt in my mind that the dialogue is really about little more than terminology.

Both groups agree that there are indeed widespread, serious, immediate, and long-range financial difficulties in store for our colleges and universities. Allow me to cite some of the evidence. Earle Cheit's Carnegie Commission Study on the financial status of forty-one colleges and universities, chosen as representative of the major types of higher education institutions, provides perhaps the most broadly based data. Utilizing as the criterion whether an institution's current financial condition forced upon it a loss of quality or a loss of services, eleven institutions were found to be "in difficulty," eighteen were designated as "headed for trouble," and twelve were classified as "not in trouble." No class of institutions was found to be free from financial difficulty, although financial trouble was more likely to be found in private institutions, urban institutions, regional universities, and those having high student aid and high faculty salary costs. Based upon this study, the Carnegie Commission estimates that roughly 1,000 institutions, enrolling 4 million students (56 percent of the total) could be considered "headed for trouble."

William Jellema's excellent study of the financial status of the members of the Association of American Colleges—which includes almost all private institutions in this country—paints at least an equally pessimistic picture. The AAC found that "average" institutions enjoyed a net surplus in 1968, but experienced net deficits in 1969. By 1970, the average deficit per year was $131,000, or five times what it had been only a year earlier. According to Jellema, the full significance of these figures can only be appreciated in light of the fact that these greatly increased deficits occurred during a period when operations were being curtailed, faculty members were being discharged or were simply not being replaced, and academic programs were being reduced. Between 40 and 60 percent of all private institutions are now running deficits with the situation being from serious to critical. One-fourth of all deficits are in excess of 7 percent. For this group, the range of deficits is from 7.4 percent to 29.1 percent of the current fund budget. In the conclusions to a follow-up survey, Jellema estimated that 107 of the colleges which responded would have totally depleted their liquid assets in 1970-71, if deficits remained at the reported 1968-69 levels. On the basis of the revised 1970-71 budget estimates, 122 institutions will have now depleted their liquid assets and at the moment, may reasonably be called "broke." At this rate an estimated 365 of the nation's 762 private, accredited, four-year institutions will have no liquid assets within ten years.

A 1971 report of the National Association of State Universities and Land-Grant Colleges showed deficits also to be emerging in public colleges and universities, where the enrollment pressures are greatest and where there is strong competition for the tax dollar. Alabama A & M, Florida State, Oklahoma State, Rutgers, Houston, Michigan, Maine, Alaska, and Vermont Universities all reported deficits for 1970–71. Furthermore, the total may almost double this year with an additional sixty institutions kept solvent only by the severest economic measures.

A crisis? Perhaps not. Shall we call it, instead, a severe economic depression? But what does the future promise? On this point, the economists and the educators are in general agreement. The proportion of state budgets allocated to higher education will probably remain stable in the decade of the seventies. There are high priorities facing the states, including health services, the environment, and mass transportation. Thus, significant additional funds for higher education will very likely result only if the size of the total resource pool is also enlarged. In all likelihood, institutions will look more and more to the federal government and to higher tuitions to meet the increasing costs.

The last part of this background information section deals with how the present bill is being paid. It is necessary to know who is now paying the bill before talking about how much more each segment *should* pay. The first requirement is to listen very carefully to what is being said. For example, if only tuition and fees are considered, currently about 16 percent of all public and 40 percent of all private institutional expenditures for "educational and general" purposes come from this source. However, if tuition and fee income is applied, as it more commonly is, to the more narrowly defined "instruction and departmental research" categories, it accounts for about one-third and four-fifths of the expenditures of public and private institutions, respectively. In addition, as any student and any parent knows, there are other costs to be borne. And this is where the careful listening is required. When room and board costs and the costs of travel and books, etc., are added, students and their families will have borne nearly $22 billion of the cost of higher education during the coming academic year. This will be approximately 75 percent of the total costs of higher education listed by the Carnegie Commission. But there is more. This figure does not include non-degree or part-time students, which would substantially raise the percentage figures. Even more important from the cost side, it does not include student foregone income. Foregone income is a cost the economists tell us must be charged to higher education. It is the amount that would have been earned by students if they had joined the work force instead of going to college. Today, this concept, which first entered the literature in 1960, is almost universally accepted. When foregone earnings are added to the total costs of higher education, estimates are that the true portion of the total higher education cost that is borne by the student and his family cannot possibly be less than two-thirds and is probably closer to seven-eights. Three-fourths or 75 percent seems to be the most commonly accepted figure among economists.

Let me now briefly summarize this background information.

1. The total dollars spent (not including dollars foregone) on higher education this academic year are $26.5 billion, approximately three-fourths of which is borne by students and their families.[1] By the 1980 academic year, the costs will be $43.8 billion.
2. The relative amount of financial support will probably not increase at the state level. Increases will occur only if the total pool of resources is enlarged. Thus, the federal government and/or the student and his family will be asked to share more of the burden.
3. The present financial condition of higher education, although perhaps not absolutely desperate, is indeed bleak, which means that new funding strategies must be examined.

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[1] It is not clear from Commission reports just what is included in the $26.5 billion figure. When all amounts are considered, three-fourths is probably quite accurate.

Consideration of the Various Plans

On then to the second part of this discussion—what are the various plans for financing higher education, what are the rationales for these various plans, and what are their implications for access? There are, of course, more plans for the financing of higher education than reasonably can be discussed here. Fortunately, almost all plans have certain common threads or "strategies" which *can* be described and examined.

The basic argument concerning funding, among concerned observers, is whether higher education should be financed through students or through institutions directly. Necessary to the analysis is an understanding of the philosophy or theory behind each viewpoint. Underlying the differences of opinion about how higher education should be financed is the basic question: "Who benefits from higher education?" For it is argued that he who benefits should pay; at least, so goes the rhetoric.

Again, there is a dichotomy. Some argue that it is the individual who benefits. Others argue that it is society. Let us examine these two viewpoints. Exponents of the individual benefits theory list as evidence: significantly greater lifetime income, greater productivity and thus attractiveness to employers, and the improved lifestyle of college graduates as opposed to nongraduates. For these reasons, it is argued, the individual should pay for his education through full cost tuition and fees. If the student lacks the necessary resources, loans should be made available. This philosophy is sometimes used to argue for grants to low-income youth.

The second viewpoint is that society is the real beneficiary of higher education because college educated persons are more open-minded, critical, and socially responsive. Therefore, society, through the local, state, and federal governments, should provide the major support for higher education. There are differences within this second viewpoint as to whether societal support should be given *directly* to the institutions or *indirectly* to institutions through students. I shall generally use the term *student vouchers* in speaking of this latter mode.

The Individual Benefits Theory

Having stated the general viewpoints, the soundness of the evidence will now be examined. First, the individual benefits theory: Probably the major evidence supporting this argument is that college graduates on the average earn approximately $200,000 more in their lifetimes than do those who are not college graduates—clearly a significant sum if indeed it can be ascribed to the college diploma. In actuality, the economists tell us the figure is probably much too high. Lee Hansen, of the University of Wisconsin, estimates that 25 percent of the difference in lifetime earnings between the two groups can be attributed to ability and motivation. In other words, the two groups are not really comparable. College graduates are more likely to earn higher incomes simply because they are better motivated and better endowed for economic success in our society. Their persistence in college is *prima facie* evidence of this. Further confounding the picture is the fact that present income is worth a good deal more than future income. Therefore, income foregone due to college attendance, is especially costly. Also, taxes must eventually be paid on that greater, anticipated income. Thus, Hansen and Weisbrod estimate that the true dollar income to be eventually earned is not $200,000 but is $89,000; and, furthermore, when corrections are made for the present-day value of future earnings, *the actual lifetime earnings of the college graduate over the non-college graduate is $20,900.* For women it is even less. To quote Hansen and Weisbrod, "Viewed in this light—the light in which, incidentally, an ordinary investment is viewed in business capital markets—higher education is a good deal less valuable than is commonly believed."[2]

Holding the counter-arguments for just a moment, let us take a quick look at graduate education. Using the same techniques, Hansen and Weisbrod find that an average male can expect about $27,000 of additional lifetime income, having a present value of $5,800 as a result of his investment in graduate education. At the master's level the return is very small indeed, whereas it is somewhat larger for the Ph.D.

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[2] W. Lee Hansen and Burton A. Weisbrod. *Benefits, Costs, and Finance of Public Higher Education* (Chicago: Markham Publishing Company, 1969), pp. 26-27.

If this is so, why is higher education so attractive to so many? Some of the reason is undoubtedly tied up in the phenomenon of our credentialing society. The economists apparently fail to consider that ability and motivation are not sufficient to obtain credentials; academic degrees are needed for this. Thus, adjustments lowering the economic value of the B.A. may not be entirely valid. Attempts to adjust for the incomparability of college and noncollege graduates would appear to be, at the very least, moot.

But even more significant in assessing the individual benefits of higher education is what was referred to earlier as the improved life style with a college degree. The term often used by economists is *psychic income.* Psychic income is really foregone income, but is income foregone forever. It is the amount of earnings which were foregone in favor of some preference in life style. To illustrate, each of you has probably rejected some offer of increased income because you were not prepared to pay the particular "costs" of accepting that income. For example, undoubtedly, some of you have declined an offer of a higher salary from a large urban college or university for "personal" reasons. The professor who declined vastly improved earnings through industrial employment in favor of "the good life of academe" may be a creature of the past, but he does demonstrate my point. In these cases real income was foregone in favor of psychic income.

In some cases psychic income may be purely the value attached to status. How else can we explain the ever-increasing college enrollments, even among prospective teachers, in the face of the higher earnings of the members of certain lesser status occupational groups, such as plumbers, auto mechanics, policemen, and firemen. The difference can no longer be ascribed to the security resulting from the college degree. The prospectus for gaining employment as a teacher, for example, is considerably less than for many jobs which do not require the baccalaureate. Perhaps another part of the answer is in the greater potential for higher earnings even though these earnings may never materialize. But this too must be considered psychic income, if it is, in fact, ever gained. When Clark Kerr writes of the very real possibility that we may need to pay more—not less—for those persons who hold the less desirable jobs, he is talking about psychic income.

If I may continue on this tangent for just a bit longer, the Carnegie Commission and the United States Office of Education estimate that until 1980, at least, only 20 percent of all jobs reasonably will require the holder to possess a B.A. Yet we are currently admitting nationally 50 percent of all high school graduates, and the figure is about 70 percent in California. Although dropout rates are considerable and these data are contentious, clearly there is some point at which our society *may* become overeducated. It *can* happen. About two months ago, it was reported that unemployment rates among college graduates in Sweden ran as high as 50 to 75 percent. The reasons are an exacerbation of the same conditions which appear to be developing in this country—near universal higher education supported by considerable government subsidies. Admittedly, there are other purposes of higher education besides preparation for work. However, anyone who has spoken to an unemployed or underemployed teacher, aerospace engineer, or college professor, knows this to be a real rather than an imagined issue.

Does this have any implications? At this point no one can say. Logically, one might predict fewer financial incentives for enrolling in higher education, although because this would probably work against equal educational opportunity, such a development is doubtful at present. More likely is the eventual possibility of a kind of penalty in the form of higher tuition.

The Societal Benefits Theory

Now to the societal benefits theory. Proponents of this philosophy point out that the individual's economic productivity is shared by society in the form of taxes. They also point out that the college educated occupy fewer jail cells, have fewer auto accidents, are healthier, and have lower absentee rates from their jobs. In comparison to nongraduates, college graduates less frequently receive welfare and unemployment compensation, thus reducing the total transfer payments required of society. In a report to the Committee for Economic Development, Edward Denison showed that the education of the labor force accounted for 23 percent and the advancement of knowledge accounted for 20 percent of the growth in the gross national product between 1929 and 1957. These figures have dropped only modestly since 1959. Further, in this country education is still considered the primary route to social mobility. Many of those who maintain that only the individual benefits from higher education, also argue for subsidization of the higher education of the poor. By so doing, they necessarily acknowledge that an important social benefit of higher education is the equalization of opportunity. Thus, it seems to me, they defeat their own argument.

All this is not to say that the individual fails to benefit from higher education, because obviously he does benefit. What the analysis does show is that the individual probably benefits a good deal more in a psychic than in a monetary form. In conclusion to this question, there is little to suggest that one side—society or the individual—benefits significantly more than the other. Clearly those who argue that there are very little if any returns to either side cannot, from my analysis, be taken very seriously.

Discussion

Now then, where do each of these theories lead? The individual benefits position argues for full cost tuition. The societal benefits position argues for tax support of either institutions of individuals. Under the individual benefits theory, if the individual needs government aid, government loans should be available. In the case of low income students, some proponents of this position argue for grants rather than loans. Many, however, recognize the inconsistency between the individual benefits theory and any support to individuals—that would be a societal benefits doctrine. Arguing for grants would clearly seem to be an admission of the social benefits of higher education *vis-à-vis* equality of economic opportunity.

There *are*, nevertheless, those who use the individual benefits theory to argue for full-cost tuition and educational grants to the poor. Interestingly, these persons are often the more liberal economists and educational spokesmen, persons who would ordinarily be expected to be on the social benefits side of most such questions. In this case, they find themselves closely allied with Milton Freedman, the leading spokesman of free-market economic theory.

Now let me review where we are up to this point. First, we have shown that the individual benefits theory argues for very high or full-cost tuition. It argues for student loans to the nonaffluent, although we have not yet discussed the nature of those loans. We have also seen that some spokesmen invoke the individual benefits theory to justify grants to low-income youth as the best means to equalize educational opportunity. Second, we have seen that under the societal benefits theory there are two major funding modes: students and institutions.

Individual Benefits Plans

Now let's move on to some variations in loan forms, and some variations in forms of student grants or supplements and in institutional grants. The rationale for each is our major concern here.

Loans come under the individual benefits theory. Loans are already a major source of financing higher education. Students borrowed $1.5 billion this year; in fact, 28 percent of all student assistance was in the form of loans. Forty-three percent of all private, four-year college sophomores and 33 percent of public, four-year college sophomores borrowed to support their higher education this academic year.

Loan proposals generally take one of two forms: conventional, that is, a fixed schedule loan, and the income contingency loan. In a conventional loan the borrower knows in advance the rate of interest and the period of the loan. He can only guess at what his problems will be in repaying the loan. On the other hand, under the income contingency loan the borrower knows the repayment rate but only as a percent of unknown future income. He knows what the maximum repayment period will be and he knows the upper limit of the amount he will have to repay. This limit may be some maximum loan rate, such as 7 percent, or some multiple of the original debt, such as 150 percent. Simply stated, the advantages of the income contingency plan are seen as two. First, the amount of repayment is a function of later earnings. Second, and because of the first reason, contingency loans have an equalizing effect; that is, those who earn more will subsidize the education of those who earn less.[3]

Income contingency loans would seem to have considerable promise in rapidly, if not immediately, increasing the total financial resources presently available to higher education. As a rationale, it has been suggested that the contingency loan plan would free colleges to set their own priorities while increasing the number of low-income students, but in such a way as to cause these students to invest in their own education. This is, in my view, an important point and one which is not usually a part of the rationale of other funding modes. It has also been suggested that this kind of loan would ultimately enhance the financial conditions of private colleges and universities by eliminating the church-state problem, while at the same time allowing students to *afford* private schooling. Further, it is maintained that contingency loans would match low- and middle-income students with institutions having vacant student stations. Finally, the income contingent loan plan would reduce disparities in educational expenditures among rich and poor states, thus again tending to equalize educational opportunity.

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[3] D. Bruce Johnstone, "Income Contingent Loans: What Role in the Financing of Higher Education?" The Ford Foundation, December 1971.

In opposition, others point out that society, not the individual, is the major beneficiary and thus society should carry most of the financial load. These persons insist that the present policy of low tuition in public institutions is a better way to insure equal educational opportunity, because most low income students would be reluctant to obligate themselves for a long period of financial repayment. They also point out that there are at least serious technical problems with the plan. First, they fear that legislatures would use contingency loans as an excuse for decreasing total support; and second, they point out that no college or private agency has resources sufficient to operationalize such a system. Indeed, the Ford Foundation recently decided not to finance income contingency loans for precisely this reason.

Howard R. Bowen, who is in my view the most thoughtful and perceptive of the higher education economists—which I suppose means he agrees with me, or rather I with him—has pointed out two additional problems. First, says Bowen, the plan is highly inequitable between high- and low-income students. The student from a high-income family ends up his college career with little or no debt, while the student from the low-income family might owe $5,000 to $20,000 depending on the length and nature of his program. Second, and I quote from Bowen, "From the social point of view the use of loans does not achieve one of its avowed objectives, namely, to place the cost of higher education upon the students. The true economic cost of higher education consists of the use of resources *at the time* the education occurs. If these costs are financed by loans, the true economic cost is borne *at that time* by the ultimate lenders, whether they be private savers or taxpayers. They are the ones who give up the needed resources. Later, when the interest and the principal are repaid, no economic resources are used and no social cost is involved. Repayment is then merely a transfer payment from debtors to creditors."[4] Bowen tells us that we might more clearly understand this fact by recognizing the futility of trying to transfer the costs of war to future generations. Clearly the costs of war are borne, at that time, by those making the financial sacrifices.

So much for loan plans. But before leaving the discussion under the individual benefits theory, a few things must be said about full cost tuition. If such a plan were to become a reality, an assessment of the true costs of services would seem essential. Students and their families could and would properly demand that they be assessed no more than the *true* full costs. Clearly, the true costs of higher education vary by field and by level. Although there is considerable disagreement about specific relative amounts, the ratio of costs for lower-division, upper-division, and graduate education are roughly estimated to be approximately 1 to 2 to 6. In other words, lower division is clearly the least costly, with upper division costing about twice as much, and graduate education about six times as much. To further complicate the issue, there are wide variations according to discipline, with lesser costs being incurred in the social sciences and humanities, and the greatest costs being incurred in the physical sciences. It seems clear that what the economists call "market imperfections" are so severe according to level and field, that government subsidy of certain levels and fields would absolutely be required. With this would go the philosophical justification which was behind full cost tuition in the first place—i.e., the individual benefits view. Perhaps the clearest illustration of the dilemma can be brought to mind by recalling the relatively small returns to the individual of graduate education. Yet, graduate education would cost approximately four times more than undergraduate education. Therefore, subsidies would probably be mandatory.

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[4] Howard R. Bowen, "Who Pays the Higher Education Bill?" *Financing Higher Education: Alternatives for the Federal Government.* M. D. Orwig, ed. (Iowa City, Iowa: The American College Testing Program, 1971), pp. 281-98.

Another problem with full-cost tuition when tied to grants for the poor is that, in any plan to subsidize some at the expense of others, there is always some new group that is denied educational opportunity. This group is that which is just rich enough *not* to obtain a subsidy and yet too poor to pay the increased costs necessary to provide subsidization for others. The significance of this problem has been demonstrated over the past decade in private institutions where each tuition increase—increases that were required for more than any other reason to provide scholarships for disadvantaged students—eliminated a new group of prospective tuition payers.

A final proposed plan falling under the individual benefits theory, is the tax credit plan. Under this arrangement, taxpayers would be permitted to deduct from their federal income taxes an amount related to the tuition and fees paid by the taxpayers and their dependents. The rationale for this plan is that those who pay most of the taxes ought to enjoy most of the benefits. It is further argued that educational expenditures lead to a higher future tax capacity which is a good national investment. Further, tax relief to parents removes the threat of federal interference with campus autonomy.

Critics of the plan, however, point out that such a system would be regressive; lower-income groups would not benefit. They believe that private institutions would raise their tuitions, and that Congress would be satisfied that it had served the need, and that no additional legislation would be required. Presently, this plan appears unlikely to be adopted.

Societal Benefits Plans

Let us move now to plans which fall under the societal benefits umbrella. Under the societal benefits rubric, there are two major approaches to meeting the costs of higher education. Again, the arguments are vigorous. One side argues that funds should be given directly to the institution, thus allowing financial certainty, thoughtful long-range planning, and the protection of institutional integrity. The other side holds that funds should be given to the student, who would in turn direct the money to the institution of his choice.

The justification for this latter position is that by channeling funds through students, freedom of student choice would be maximized, equal educational opportunity would be insured, institutions would be required to be more responsive to the consumer (society), and tuition differentials between public and private institutions would be minimized, as would the direct influence of the government in institutional affairs. Supporters further list as rationale, that the voucher would:

1. Encourage the fullest use of available facilities both public and private.
2. Make possible continued and effective competition between public and private higher education.
3. Encourage diversity at the undergraduate level.

The primary fear regarding the student funding mode among public institution spokesmen is the belief that many students would select private institutions, thus drawing support away from the public sector. Other arguments are that the student voucher funding pattern would promote religion and segregation (raising constitutional questions) and would lower "quality" because colleges would offer curriculum with "sales appeal" rather than programs that are necessary and sound. Further, opponents argue that vouchers:

1. Would give students more influence and would encourage them to seek more power.
2. Would require the institutions to get financial relief through students when they should get it directly as a matter of right.
3. Would be used by legislatures to save money.

At the root of the voucher notion is the question of access. Presently, most governmental aid to students does *not* go to low-income youth. This is especially true at the federal level where the majority of student aid is in the form of grants through such instruments as social security programs and the GI bill. In addition, there are indirect subsidies in the form of tax free grants and fellowships and special dependency regulations of the internal revenue service.

Such conditions are only part of the reasons why lower-income youth attend college in smaller proportions than do higher income youth. Because I am sure you are all aware of the overwhelming evidence in support of this statement, I shall only remind you that at all ability levels, the percentage of higher SES students is two or three times greater than the percentage of lowest SES students in college. It is for this reason, more than any other, that proponents of new funding forms are seeking to target societal support on low-income youth.

Thus, for example, the Carnegie Commission has advocated a "national entitlement" to increase equality of opportunity. Both the Carnegie Commission and the present Senate version of the national higher education legislation favor institutional aid *only* to support equality of opportunity. The Carnegie Commission favors grants to low-income students with full-cost tuition going to the institution enrolling these students. The Commission believes that through this means the basic responsibility for financing higher education would remain with the states, that institutional autonomy would be preserved, that there would be no constitutional problems, and that this form of federal support would not encourage a reduction in state support. The now-famous Newman report generally supports the Carnegie and Senate approaches and argues further that financing higher education through students would allow greater flexibility in where, how, and when students chose their higher education.

There are certain general arguments, both pro and con, for providing general, direct support to institutions. Those who argue in favor of general, direct supports point out that this approach fosters the integrity of the institution; it allows the college to set its own priorities and spend its own money as it sees fit; it *assures* financial aid to institutions; and it has the support of most of the higher education professional societies. It also appeals to every college, and thus is politically popular in every congressional district.

The problems with general direct aid to institutions are:

1. It is difficult for the federal government to select or reject institutions.
2. Some money would go to institutions of very low quality, to others that really do not need it, and still to others that serve very little social purpose.
3. The money will often not be spent wisely.
4. Institutions agree that there ought to be support, but they clearly cannot agree on the formula for distribution.

5. Institutional support will lead to institutional control by state and federal government.[5]

I will mention only a few other suggested forms of institutional support. None of these will be revelations to you. The various pros and cons, however, might be of interest.

A more specialized form of institutional support is the categorical grant. In this case funding is based on certain criteria, or on the performance of certain tasks, or for the development of certain programs. The rationale for such programs is that they are responsive to national needs; they allow flexibility in adjusting to massive changes either abroad or at home; they supplement state and private support for higher education rather than replacing it. And, they can also aid in the establishment of new enterprises.

On the debit side, categorical grants allow the government, rather than the institution, to establish priorities. By so doing, institutional autonomy is jeopardized, the delicate internal balance of higher education is upset, and the temporary nature of categorical grants provokes instability in personal careers and institutional income.[6] Perhaps most important of all, higher education's role as social critic is less likely to be served.

The final plan which I will mention appears at present to be no more likely to be realized than the tax credit plan. This final plan would involve revenue sharing with the states. Proponents of this plan point out that it would strengthen the states and thus bolster the intent of the constitution. It would cause income redistribution because progressive income tax funds would be shared. And it would draw political support from state governors and legislatures. Critics fear the chaos that would occur as a result of fifty different higher education policies, many of which would be unenlightened. Critics also fear greater state control of institutions, and they fear that the states would withdraw their own support of higher education.

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[5] Clark Kerr, "New Challenges to the College and University," *Agenda for the Nation* (Washington, D.C.: The Brookings Institution, 1968).

[6] Ibid.

Conclusions

Let me see now if I can summarize where we are at this point. We have talked about individual and societal benefits of higher education. We have pointed out that the individual benefits theory suggests full-cost tuition and student loans. We have observed that some proponents of the student voucher mode believe their plan to be dependent upon acceptance of the individual benefits theory. I believe we have shown that this thinking is not sound. We have seen that under the social benefits theory it is possible to argue for either the student funding mode or the institutional funding mode. And, finally, we have talked about the rationale and the counter arguments for each funding mode. Now let me see if I can make some conclusions.

I think it is first crucial to realize that equal access is the overriding value behind the best articulated and the most-likely-to-occur forms of funding. This is clear in the case of the recommendations of the Carnegie Commission, the Ford Foundation, and the Newman Task Force. It is also the gist of the Senate version of the higher education bill.

A second conclusion deals with the matter of individual versus social benefits. First, it seems clear that both society and the individual do gain from higher education. The exact division of these benefits is unclear; however, it is doubtful that either society or the individual benefits far in excess of the other. Thus, because the individual and his family are now absorbing no less than two-thirds and perhaps as much as seven-eights of all higher education costs, there does not appear to be justification *on these grounds* for raising the student's share even higher. If we deem it appropriate, *on some other grounds*, to assess middle- and upper-income groups the full cost of higher education, so be it. But let us not pretend there are no social benefits from higher education. Let us also be aware that we are imbibing in a form of double taxation. And let us be aware that if we do not readjust the full tuition costs on the basis of level and field we will be perpetrating triple taxation as a minimum.

It would seem at least more equitable, to argue for very low or no tuition, with the primary funding of higher education being the progressive income tax. Such a plan would necessarily include special subsidies for low-income youth and some significant form of subsidy to private higher education.

The problem of financing private higher education is perhaps the most difficult of all to resolve. A redressing of the current competitive imbalance between private and public institutions demands immediate attention. The financial condition of private colleges is such that unless this imbalance is alleviated, they cannot survive. To this much I agree. However, I believe the oft suggested solution that public institution tuition be raised would not be in the best interest of either the private institutions or of the whole of higher education. Higher tuitions would have the effects of protective tariffs, which always seem to lead eventually to more severe problems. Higher tuitions would add prohibitively to the cost of higher education for the great mass of students from middle income families. Further, it is doubtful whether such measures would alleviate the financial difficulties of the greatest number of troubled private institutions—those which are experiencing the greatest enrollment difficulties. I am speaking of the small, rural, religious, single-sex, and "local" colleges. I doubt that protective tariffs would significantly alter the diminishing number of students selecting these kinds of institutions.

Further, protection of the diversity within higher education, represented by private institutions, and the autonomy of private colleges is probably contingent upon the nature of the financial relief finally obtained. For these and the aforementioned reasons, contracts between the states and private institutions to educate students would appear to make good sense. Contracts would encourage diversity and decrease the negative effects of tuition imbalances, while at the same time protecting institutional autonomies. The Carnegie proposal involving grants to accompany low-income students, on the other hand, would probably work to the detriment of private institutions because of the greatly increased student services and expanded curriculum demanded by low-income groups, especially those of minority races. A contractual arrangement would seem far superior.

Implications for Access

Now what does all this mean in terms of access? The implicit theme of this paper is that access policies are primarily matters of finance. To consider access questions, without talking about plans for funding, would be folly. It would be to raise hopes without providing the means for realizing goals related to equal access.

What I am saying is *that the course we choose regarding funding will dictate how we react to the problems of access.* There is no consideration more basic to the several alternative plans for funding than access. The Carnegie and Senate plans would go a long way in equalizing access, but only at considerable costs to institutional autonomy, especially in the area of goal setting. Frankly, I do not think it wise for most if not all private colleges to get into the business of educating minority groups. There is simply not enough faculty talent and not enough fiscal resources to develop the special programs demanded. Rather, certain institutions should be designated to meet this need—among other needs—and contracts awarded. Some public and some private institutions are doing yeoman service in this area now. The colleges originally founded to serve blacks are one group—but only one—of such colleges.

High- or full-cost tuition plans would also improve access for some but would tend to deny access to others. Grants directly to institutions might improve access, but we cannot be very sure about this. Contracts to institutions for the education of students, on the other hand, if coupled with low tuition in public colleges, would greatly improve access, at little cost to institutional autonomy, while going a considerable distance toward solving some of the financial problems of private schools.

Future Financing of Higher Education

As the last item—What does the future promise for the financing of higher education? It seems clear that several of the newer funding forms will come to pass, although it is doubtful that any mode will or should predominate. Federal and state grants to students, probably with full tuition grants to institutions, are one such likely form. General institutional grants and categorical grants will continue although perhaps at a slightly to moderately reduced rate. There will also be some redressing of the competitive balance between private and public colleges, although the public institutions will maintain a competitive edge. One vehicle will be some sort of public subsidy of certain students who attend private colleges. Loans, especially those of the contingency variety, will also increase as tuition continues to rise nationally only slightly more slowly than in the past decade. As indicated earlier, total governmental support of higher education will not increase substantially on a relative basis. If significant new income sources are to be found, they will most likely occur through productivity gains within institutions. However invidious to faculty, there appears to be no real alternative, over the long run, to greater "output" through increased student-faculty ratios in the form of larger class sizes and/or increased teaching loads. With academic instruction consuming 50 percent of the budget in all kinds of institutions of all sizes, there seems to be no escaping this conclusion. We will almost certainly have to look to the largest budget area for savings.

Finally, and I will close with this: Although these projections seem defensible under present conditions, any one of a number of possibilities, if not likelihoods, could upset the delicate balance. Two such likelihoods relate to the eighteen-year-old vote. If, as now appears very likely, the courts should continue to support the elimination of nonresident tuition, or if the courts should rule eighteen-year-olds to be adults and thus legally independent of family income for purposes of receiving loans and grants, we would have a whole new ball game on our hands.

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